

<b>CONDIBRI TENEMENT - Mapping and Expert Panel Results</b>
endangered (7% remaining in Eastern Darling Downs). Designated as of State significance (Special Biodiversity Values: centre of endemism; refuge from clearing; and distinct variation in species composition). Vegetation along part of the Condamine River (eastern extent within the tenement area) has been mapped under this category.
<i>Miles area – outliers of Mulga taxa:</i> Locally, this is the eastern range limit of Mulga Lands taxa (egs. <i>Acacia aprepta</i> , <i>A. shirleyi</i> and <i>A. microsperma</i> ). Designated as of Regional significance (Special Biodiversity Values: disjunct populations; geographic range limits; and distinct variation in species composition). Several remnants located south of Miles on either side of Leichhardt Highway.
<b>J Rating - Corridors</b>
<i>Terrestrial Bioregional Corridor:</i> Maintaining connectivity across a landscape through corridors or 'stepping stones' of remnant vegetation is important for the long-term conservation of biodiversity. Within the Study Area remnant vegetation within and adjacent to Condamine SF in the south have been designated as of "State" significance as a Terrestrial Bioregional Corridor by the expert panel.
<i>Riparian Bioregional Corridor:</i> Remnant vegetation along the Condamine River has been afforded "State" significance as a Riparian Bioregional Corridor. Small remnants adjacent to riparian tracts along the Condamine River have been afforded "Regional" significance under the same category.
<b>Bio_Sig - Biodiversity Significance</b>
The Biodiversity Significance rating of REs as to their State, Regional or Local significance is based on a combination of results from the diagnostic criteria. The majority of REs mapped for the tenement area are rated as "State" significant with two tracts mapped as "State Significant for EVR Taxa" within Condamine SF. REs mapped as "Regionally" significant are scattered throughout the Study Area but are concentrated in vegetation west of the Leichhardt Highway and along Columboola Creek.

### D.3.3 WOLEEBEE TENEMENT

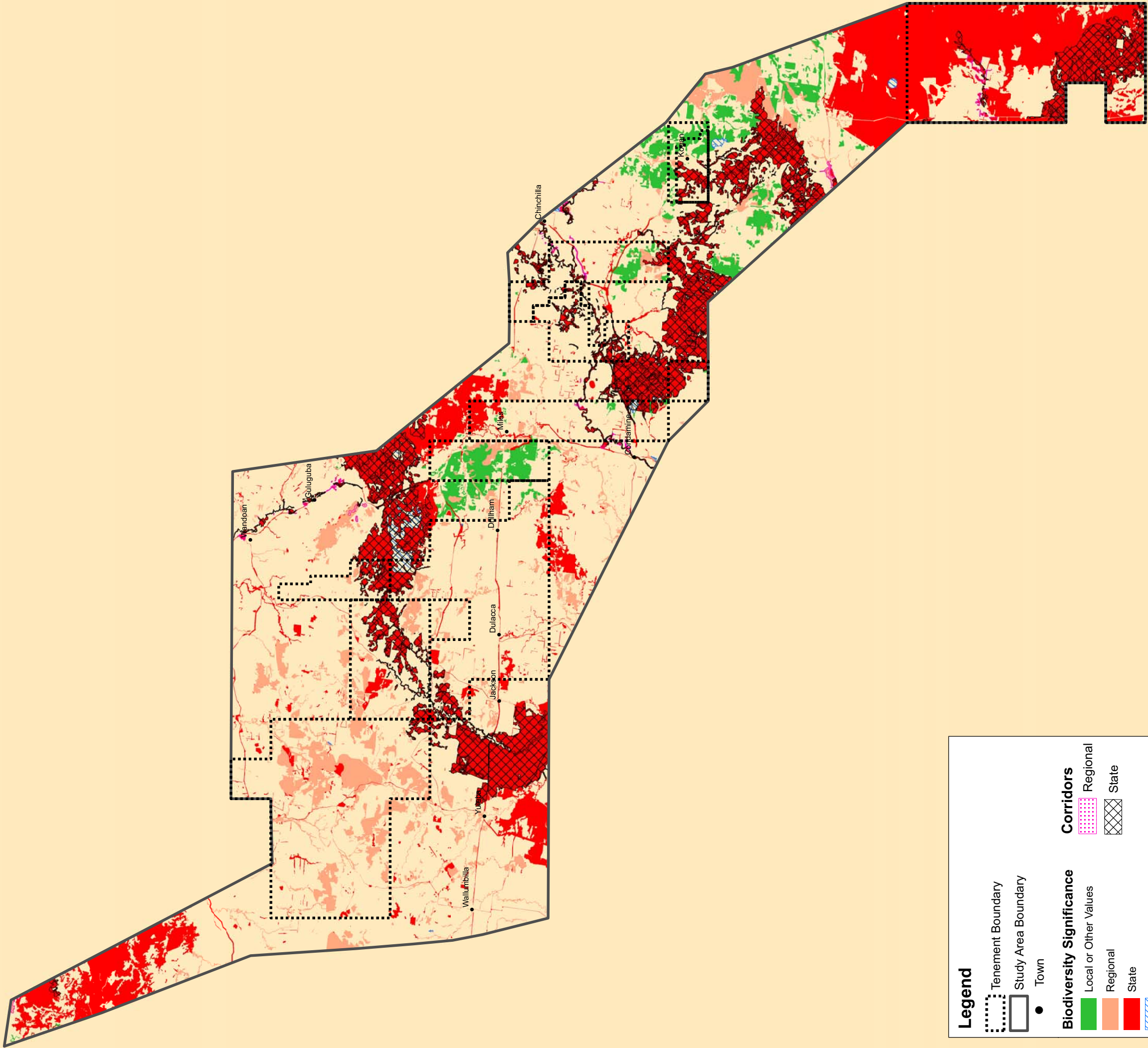
The Woleebee Tenement is an irregularly shaped area adjacent to the northern boundary of Carinya tenement. This area covers approximately 140 km<sup>2</sup>. The northern boundary of the tenement is approximately 11 km south-west of Wandoan and extends south for 25 km. The western boundary is more or less adjacent to the Jackson Wandoan Road (**Figure D.1**). Topography covered by this area is gently undulating in the north. In the south the terrain rises in altitude and there are several 'jump-ups' and steep hilly terrain in the Gurulmundi area. Major habitat features include Woleebee Creek

and several tributaries including Hellhole Creek and Sheepstation Creek. Native vegetation is concentrated in the south around Gurulmundi State Forest (SF), part of which is included within the tenement area.

The tenement covers two subregions within the Brigalow Belt South Bioregion: Taroom Downs (25) and Southern Downs (26). **Table D.4** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.3** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.4. Woleebee BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>WOLEEBEE TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
Much of the vegetation in the tenement area has been mapped as 'Low' or 'Medium' value for EVR taxa. Areas mapped as "High" value habitat under this category are located in the south, within or adjacent to Gurulmundi SF. Listed fauna records for these areas are for Brigalow Scaly-foot <i>Paradelma orientalis</i> (Vulnerable – NC Act) and listed plant records are for Ooline <i>Cadellia pentastylis</i> (Vulnerable – NC Act). Another small area designated as this value is located centrally within the tenement area.
<b>B1 Rating - State Ecosystem Value</b>
Scattered Regional Ecosystems within the Study Area mapped as having "Very High" or "High" State Ecosystem Value for the following reasons:
<ul style="list-style-type: none"> <li>All Endangered REs within the tenement area are mapped as having "Very High" State Ecosystem Value. Areas mapped under this category include several southern remnants within, or adjacent to Gurulmundi SF. These areas include Semi-evergreen Vine Thicket (RE 11.9.4a). linear strips following the Warrego Highway. Large areas also occur south of Warrego Highway along Drillham Creek. Another isolated fragment of <i>Acacia harpophylla</i> forest (RE 11.9.5) occurs in the north of the Study Area.</li> <li>All Of Concern REs are afforded "High" State Ecosystem Value. One remnant mapped under this category is located in the north along Woleebee Creek.</li> </ul>



### Legend

----- Tenement Boundary

Study Area Boundary

• Town

### Biodiversity Significance

Local or Other Values

Regional

State

State Habitat for EVR taxa

### Corridors

Regional

State

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Figure 2.2

Study Area Biodiversity Planning Assessment (BPA) Mapping -  
Biodiversity Significance and Corridors  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS



<b>WOLEEBEE TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
The remaining REs are mapped as being of “Medium” State Ecosystem Value.
<b>B2 Rating - Regional Ecosystem Value</b>
A single isolated remnant mapped as “Very High Conservation Value” is located in the north of the tenement area. Areas mapped as “High Conservation Value” include several southern remnants within, or adjacent to Gurulmundi SF. The remaining remnants within the tenement area are mapped as “Moderate Conservation Value”.
<b>C Rating - Tract Size</b>
Within the tenement area much of the remnant vegetation is mapped as “Very High” or “High” value tracts. “Very High” value tracts are located adjacent to (and including) Gurulmundi SF in the south and along Wolleebee Creek in the north. “High” value tracts are located north of the Gurulmundi SF area.
<b>D1 Rating - State Relative Ecosystem Size</b>
Much of the tenement area is mapped as “Low” value. However, large tracts of vegetation including and adjacent to Gurulmundi SF in the south of the tenement area have been mapped as “High” value.
<b>D2 Rating - Regional Relative Ecosystem Size</b>
“Very High” value tracts are located adjacent to (and including) Gurulmundi SF in the south of the tenement area, and along Wolleebee Creek in the north. The rest of the tenement area is mapped as “Low” value under this category.
<b>E Rating - Condition</b>
All mapped REs within the Study Area are afforded a “Very High” condition rating.
<b>F Rating - Ecosystem Diversity</b>
Large areas mapped as having “Very High” Ecosystem Diversity are located adjacent to, and including Gurulmundi SF (south). Scattered small remnants mapped as “High” value are located north of this area and along Wolleebee Creek (northern section of tenement area). Remaining REs are mapped as having “Medium” or “Low” Ecosystem Diversity.
<b>G Rating - Context and connection</b>
The majority of Res within the Study Area are mapped as having “Low” or “Medium” value under this criterion. REs mapped as “Very High” or “High” are scattered through the southern end of the tenement area, adjacent to and including Gurulmundi SF (southern extent of tenement area).
<b>H Rating - Core Habitat for Priority Taxa</b>
No habitat within the Study Area has been designated under this category.
<b>I Rating - Special Biodiversity values</b>
<i>Fragmented sub-regions (State):</i> The expert panel designated fragmented remnants (in subregions with less than 30% remnant vegetation) to be of State significance (“Very High” Special Biodiversity Values – refuge from clearing), when containing the largest remaining examples of an RE within a subregion. Much of the remnant vegetation within and adjacent to Gurulmundi SF is mapped under this category as well as along Wolleebee Creek in the north.
<i>Fragmented sub-regions (Regional):</i> The expert panel designated fragmented remnants to be of Regional significance (“High” Special Biodiversity Values – refuge from clearing), in subregions with less than 30% remnant vegetation. Scattered remnants within the tenement area are mapped under this category.
<i>Fragmented sub-regions (stockroutes and road reserves):</i> Stockroutes and associated reserves provide critical connectivity in fragmented landscapes. The expert panel designated these areas as of State significance (“Very High” Special Biodiversity Values – refuge from clearing) in subregions with less than 30% remnant vegetation. Road Reserves along Jackson Wandoan Road are mapped under this category.
<i>Gurulmundi:</i> This is an area of diverse habitat types including shrubland on rock pavement, acacia thickets, mixed eucalypt slopes, cypress pine woodland and vine thickets. The area provides habitat for EVR plant taxa and localized endemics. Designated as of “State” significance (Special Biodiversity Values: centre of endemism; disjunct populations; geographic range limits; and high species richness). Large areas of vegetation mapped under this category are located in the south of the tenement area adjacent to and including areas of Gurulmundi SF.
<i>Remnant vine-thickets:</i> Vine-thickets have high flora species diversity and provide habitat for endemic fauna such as snails and insects. In the Brigalow Belt vine-thickets are considered mesic outliers of coastal vegetation types. Designated as of “State” significance (Very High Special Biodiversity Values: centre of endemism; refuge from clearing; and distinct variation in species composition). Remnants mapped under this category are located within or adjacent to Gurulmundi SF in the south of the tenement area.
<b>J Rating - Corridors</b>
<i>Terrestrial Bioregional Corridor:</i> Within the tenement area remnant vegetation in the south (within and adjacent to Gurulmundi SF) has been designated as of “State” significance as a Terrestrial Bioregional Corridor by the expert panel.
<b>Bio_Sig - Biodiversity Significance</b>
The Biodiversity Significance rating of REs as to their State, Regional or Local significance is based on a combination of results from the diagnostic criteria. The majority of REs mapped for the Study Area are rated as “State” significant. REs mapped as “Regionally” significant are largely scattered through the central portion of the Study Area.

#### D.3.4 COMBABULA/RAMYARD TENEMENT

Combabula/Ramyard Tenement tenement area is an irregularly shaped area adjacent to Wolleebee tenement (eastern boundary) and Carinya tenement (both eastern and southern boundary). This large tenement is comprised of two adjacent areas (Combabula in the west and Ramyard in the east) covering approximately 1750 km<sup>2</sup>. The tenement extends from 16 km north to 60 north of Warrego Highway and 34 km west of Miles to 37 km east of Roma (**Figure D.1**). The tenement is irregularly shaped and does not encompass all of the area within these boundaries. Topography covered by this large area ranges from gently undulating to hilly country with some steeper terrain in the Ramyard section. Although much of the

tenement has been cleared there are still some large tracts of native vegetation, some of which is found in Combabula, Woodduck, Emu and Dinoun State Forests (SF) in the Combabula section. Major waterways include Noonga and Tchanning Creeks (Ramyard), Yuleba, Horse and Kangaroo Creeks (Combabula). Most of the Study Area is within Southern Downs subregion (26) within the Brigalow Belt South Bioregion. However the northern extreme of the Study Area is contained within Taroom Downs subregion (25).

**Table D.5** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.4** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.5. Combabula/Ramyard BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>COMBABULA/RAMYARD TENEMENT - Mapping and Expert Panel Results</b>	
<b>A Rating - Habitat for EVR Taxa</b>	
Most of the vegetation in the tenement area has been mapped as 'Low' value for EVR taxa. Several "Medium" value tracts within the Study Area are located close to Gurulmundi SF (east), Yuleba SF (south), Dinoun SF (north) and Combabula SF (central). A single remnant designated as "Very High" value habitat is located directly to the east of Combabula SF. Remnants are designated as having 'Very High' value when the unit has 'precise record/s or core habitat for one or more Endangered taxa or two or more Vulnerable or Rare taxa'. There are fauna records for Golden-tailed Gecko <i>Strophurus taenicauda</i> (formerly Rare, now Near Threatened – NC Act). Several areas mapped as "High" value habitat under this category are scattered throughout the tenement area including a large remnant within Combabula SF. Remnants are designated as having 'High' value when the unit has 'precise record/s or core habitat for one Vulnerable taxon or one Rare taxon. With in Ramyard section there are records for: plant taxa <i>Gonocarpus urceolatus</i> (Vulnerable – NC Act) adjacent to the eastern boundary; Little Pied Bat <i>Chalinolobus picatus</i> (Rare – NC Act) in the south-east corner; and Woma <i>Aspidites ramsayi</i> (Rare – NC Act) in the south-east corner adjacent to Jackson Wandoan Road.	
<b>B1 Rating - State Ecosystem Value</b>	
Scattered Regional Ecosystems within the tenement area mapped as having "Very High" or "High" State Ecosystem Value for the following reasons:	
<ul style="list-style-type: none"> <li>All Endangered REs within the tenement area are mapped as having "Very High" State Ecosystem Value. Areas mapped under this category are scattered throughout the tenement area including large remnants within Combabula SF, adjacent to Dinoun SF and along Lambing Gully (north-west).</li> <li>All Of Concern REs are afforded "High" State Ecosystem Value. Areas mapped under this category largely include riparian vegetation along creeklines. Waterways mapped under this category in the Ramyard section include Tchanning, Clark and Noonga Creeks. Waterways mapped in the Combabula section include: Yuleba and Combabula Creeks (south-east); Horse Creek (north-east); Kangaroo Creek (north; and Barton and Sugarloaf Creeks (north-west).</li> </ul>	
The remaining REs are mapped as being of "Medium" State Ecosystem Value.	
<b>B2 Rating - Regional Ecosystem Value</b>	
All areas mapped as "Very High Conservation Value" are those REs with a pre-clearing extent of <300ha or <10% of the pre-clearing extent remains in the subregion. Remnants mapped under this category are scattered throughout the tenement area including large remnants within Combabula SF and adjacent to Dinoun SF. Remnants mapped as "High Conservation Value" areas are scattered throughout the tenement area including large remnants within Emu SF and adjacent to Yuleba Taroom Road (east of Combabula SF). The remaining remnants within the tenement area are mapped as "Moderate Conservation Value".	
<b>C Rating - Tract Size</b>	
Within the tenement area most of the remnant vegetation is mapped as "Very High" or "High" value tracts. "Very High" value tracts are located within and adjacent/nearby to State Forest areas throughout. Smaller isolated "High" value tracts are scattered throughout the tenement area.	
<b>D1 Rating - State Relative Ecosystem Size</b>	
Most of the area is mapped as "Low" or "Medium" value. Some large tracts of vegetation adjacent to the eastern	



<b>COMBABULA/RAMYARD TENEMENT - Mapping and Expert Panel Results</b>
boundary of the Ramyard section of the tenement area have been mapped as “High” value. “Medium” value tracts are located within (and adjacent to) Emu SF and Dinoun SF, as well as a large tract south of Combabula SF.
<b>D2 Rating - Regional Relative Ecosystem Size</b>
Much of the tenement area is composed of remnants designated “low” or “Medium” value under this category. Within the Ramyard tenement “Very High” value tracts are located adjacent to the eastern boundary and to the west of Jackson Wandoan Road. One “Very High” value tract is located adjacent to the southern edge of Dinoun SF within the Combabula section of the tenement area. “High” value tracts are located within (and adjacent to) Emu SF and Dinoun SF and in the south-east corner of the Ramyard section.
<b>E Rating - Condition</b>
All mapped REs within the Study Area are afforded a “Very High” condition rating.
<b>F Rating - Ecosystem Diversity</b>
Much of the tenement area is mapped as having “Very High” or “High” Ecosystem Diversity. “Very High” remnants are located adjacent to the eastern boundary of Ramyard section, within Combabula SF, Horse Creek (western branch), sections of Yuleba Creek and vegetation adjacent to Six Mile Creek/Three Mile Gully south-west of Combabula SF. “High” value areas are largely concentrated around “Very High” tracts, as well as substantial areas between Combabula and Jackson Wandoan Road. The remaining areas are mapped as having “Medium” or “Low” Ecosystem Diversity.
<b>G Rating - Context and connection</b>
The majority of the tenement area is mapped as having “Low” or “Medium” value under this category. Small areas mapped as “Very High” or “High” are scattered throughout the tenement area. However, large tracts are located: adjacent to, and including Combabula SF; adjacent to the southern edge of Dinoun SF; and vegetation adjacent to Six Mile Creek/Three Mile Gully south-west of Combabula SF.
<b>H Rating - Core Habitat for Priority Taxa</b>
No habitat within the Study Area has been designated under this category.
<b>I Rating - Special Biodiversity values</b>
<i>Core Areas:</i> Based on Tract Size analysis (criterion C), the expert panel identified core areas for the southern Brigalow Belt to be of State significance (“Very High” Special Biodiversity Values – refuge from clearing). Vegetation in the south-east corner of Ramyard section (west of Jackson Wandoan Road) has been mapped as part of the Yuleba Core Area.
<i>Fragmented sub-regions (State):</i> The expert panel designated fragmented remnants (in subregions with less than 30% remnant vegetation) to be of State significance (“Very High” Special Biodiversity Values – refuge from clearing), when containing the largest remaining examples of an RE within a subregion. Within Ramyard section two large tracts of remnant vegetation located east and west of Jackson Wandoan Road are mapped under this category. Within Combabula section one large tract of vine-thicket adjacent to the southern edge of Dinoun SF is mapped under this category.
<i>Fragmented sub-regions (Regional):</i> The expert panel designated fragmented remnants to be of Regional significance (“High” Special Biodiversity Values – refuge from clearing), in subregions with less than 30% remnant vegetation. Virtually all of the vegetation within the Study Area is mapped under this category.
<i>Fragmented sub-regions (stockroutes and road reserves):</i> Stockroutes and associated reserves provide critical connectivity in fragmented landscapes. The expert panel designated these areas as of State significance (“Very High” Special Biodiversity Values – refuge from clearing) in subregions with less than 30% remnant vegetation. Road Reserves adjacent to Jackson Wandoan Road (Ramyard section), Yuleba-Taroom, McLennans, Bundi Clifford, and Cattle Creek Roads are mapped under this category in the Combabula section.
<i>Gurulmundi:</i> This is an area of diverse habitat types including shrubland on rock pavement, acacia thickets, mixed eucalypt slopes, cypress pine woodland and vine thickets. The area provides habitat for EVR plant taxa and localized endemics. Designated as of “State” significance (Special Biodiversity Values: centre of endemism; disjunct populations; geographic range limits; and high species richness). Vegetation mapped under this category is restricted to the east edge of Ramyard section.
<i>Remnant vine-thickets:</i> Vine-thickets have high flora species diversity and provide habitat for endemic fauna such as snails and insects. In the Brigalow Belt vine-thickets are considered mesic outliers of coastal vegetation types. Designated as of “State” significance (Very High Special Biodiversity Values: centre of endemism; refuge from clearing; and distinct variation in species composition). Remnants mapped under this category are located in the Combabula section: within or adjacent to Combabula and Dinoun SF, small isolated remnants in the north-east close to Lambing Gully and Sugarloaf Creek; isolated remnants east of Combabula SF; and north of Cottage Creek (south-west of Combabula SF).
<b>J Rating - Corridors</b>
Within the Study Area remnant vegetation connecting Yuleba and Gurulmundi State Forests has been designated as of “State” significance as a Terrestrial Bioregional Corridor by the expert panel. This is largely contained within the southern half of the Ramyard tenement.
<b>Bio_Sig - Biodiversity Significance</b>
All of the REs mapped for the tenement area are rated as “State” or “Regionally” significant. Much of the remnant vegetation within Ramyard section is mapped as “State” significant. Remnants mapped as “State” significant within Combabula section are scattered throughout the tenement area.

### D.3.5 KAINAMA TENEMENT

The Kainama Tenement covers an area of approximately 150 km<sup>2</sup>. The tenement is rectangular (16.5 km x 9 km) and is roughly centred around the town of Kogan (**Figure D.1**). Topography within this area is gently undulating, although there are low ridges to the east of the Tara-Kogan Road. Habitat features include Kogan Creek and associated tributaries. The tenement retains a substantial coverage of

vegetation despite no land being incorporated within State Forest. The tenement is contained within the Inglewood Sandstone subregion (32) within the Brigalow Belt South Bioregion.

**Table D.6** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.1** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.6. Kainama BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>KAINAMA TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
Much of the tenement area has been mapped as “Low” or “Moderate” value for EVR taxa. A single small area north-east of the town of Kogan has been designated as “High” value for EVR taxa. Remnants are designated as having “High” value when the unit has precise record/s or core habitat for one or more Vulnerable or Rare taxa. Listed plant record for <i>Philothea sporadica</i> (V – NC Act).
<b>B1 Rating - State Ecosystem Value</b>
Within the tenement area Regional Ecosystems largely following Kogan Creek are mapped as having “High” State Ecosystem Value for the following reasons: <ul style="list-style-type: none"> <li>All Of Concern REs are afforded “High” State Ecosystem Value. Within the Study Area these REs follow watercourses including Eleven Mile Creek, Wallan Creek (both in northern section of tenement area), Paddy Creek and Dogwood Creek (both located in the south-west).</li> </ul> The remaining REs are mapped as being of “Medium” State Ecosystem Value.
<b>B2 Rating - Regional Ecosystem Value</b>
Remnants mapped as “High Conservation Value” are restricted to remnants along Kogan Creek and part of one tributary in the north of the tenement area. The remaining remnants within the tenement area are mapped as “Moderate Conservation Value”.
<b>C Rating - Tract Size</b>
Within the tenement area most of the remnant vegetation is mapped as “Very High” or “High” value tracts. “High” value tracts are located in the east of the tenement area as well as along Kogan-Condamine Road and the southern part of Kogan Creek (within the tenement area). Several small tracts designated as “Low” and “Medium” value and are scattered throughout the tenement area.
<b>D1 Rating - State Relative Ecosystem Size</b>
Much of the tenement area is mapped as “Low” or “Medium” value. A single tract of vegetation in the north of the Study Area has been mapped as “High” value.
<b>D2 Rating - Regional Relative Ecosystem Size</b>
Much of the tenement area is mapped as “Low” or “Medium” value. A single tract of vegetation in the north of the Study Area has been mapped as “High” value.
<b>E Rating - Condition</b>
All mapped REs within the Study Area are afforded a “Very High” condition rating.
<b>F Rating - Ecosystem Diversity</b>
Much of the tenement area is mapped as having “Very High” or “High” Ecosystem Diversity. Areas mapped as having “Very High” Ecosystem Diversity are concentrated to the east of (and including) Kogan Creek. The majority of remaining REs are rated as having “High” Ecosystem Diversity.
<b>G Rating - Context and connection</b>
The few remnants mapped as “Very High” and “High” value are scattered through the north and south of the tenement area. A single large remnant of “High” value is located west of Kogan Creek in the north. The remaining vegetation is largely mapped as “Medium” value.
<b>H Rating - Core Habitat for Priority Taxa</b>
Remnants along Kogan Creek (south of Kogan) are mapped as having “Medium” value for Priority taxa (considered suitable for Brown Treecreeper <i>Climacteris picumnus</i> ). The remaining vegetation in the tenement area is not mapped as having value for EVR or priority taxa.
<b>I Rating - Special Biodiversity values</b>
There are no remnants mapped under this category within the Study Area.

<b>KAINAMA TENEMENT - Mapping and Expert Panel Results</b>
<b>J Rating - Corridors</b>
<i>Terrestrial Bioregional Corridor:</i> Within the tenement area much of the remnant vegetation east of Kogan Creek (including Kogan Creek in the south) has been designated as of "State" significance as a Terrestrial Bioregional Corridor by the expert panel.
<b>Bio_Sig - Biodiversity Significance</b>
REs mapped as "State" significant are located east of Kogan Creek and along the southern section of Kogan Creek. REs mapped as "Regionally" significant are located along the northern section of Kogan Creek (and some adjacent remnants) and smaller areas scattered through the east of the tenement area. The remaining vegetation has been designated under "Local or other values" for this category.

### D.3.6 CARINYA TENEMENT

The Carinya Tenement is an irregularly shaped area adjacent to Dalwogan tenement (eastern boundary), Combabula/Ramyard and Wolleebee tenement (both on northern boundary) and covers approximately 1050 km<sup>2</sup>. The tenement extends 11 km south and 25 km north of the Warrego Highway, and begins and ends 10 km and 60 km (respectively) west of Miles (**Figure D.1**). Topography is predominantly gently undulating south of the Gurulmundi area. The majority of the tenement has been cleared of native vegetation except for areas in the north-east, north-west and south-

east. Major habitat features include the Drillham Creek, Dulacca Creek, Tchanning Creek and Wallan creek. The north-east of the tenement includes part of Gurulmundi State Forest (SF). The tenement covers three subregions within the Brigalow Belt South Bioregion: Southern Downs (26), Barakula (27) and Dulacca Downs (28).

**Table D.7** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.3** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.7. Carinya Tenement BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>CARINYA TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
Much of the vegetation in the tenement area has been mapped as 'Low' or 'Medium' value for EVR taxa. Two remnants designated as 'Very High' value habitat are located in the north-east of the tenement area. Remnants are designated as having 'Very High' value when the unit has 'precise record/s or core habitat for one or more Endangered taxa or two or more Vulnerable or Rare taxa'. One small remnant located north of Wallan Creek (adjacent to Myranga Road) on the eastern edge of the tenement area has a listed plant record for <i>Rutidosia lanata</i> (Endangered – NC Act). Another much larger remnant in the extreme north-east, which is part of Gurulmundi SF, has a plant record for <i>Mycromyrtus carinata</i> (Endangered – NC Act). Two small areas mapped as "High" value habitat under this category are also located in the north-east one of which follows Wallan Creek. Remnants are designated as having 'High' value when the unit has 'precise record/s or core habitat for one Vulnerable taxon or one Rare taxon'.
<b>B1 Rating - State Ecosystem Value</b>
Scattered Regional Ecosystems within the tenement area mapped as having "Very High" or "High" State Ecosystem Value for the following reasons:
<ul style="list-style-type: none"> <li>All Endangered REs within the tenement area are mapped as having "Very High" State Ecosystem Value. Areas mapped under this category include linear strips following the Warrego Highway. Large areas also occur south of Warrego Highway along Drillham Creek. Other isolated fragments occur, throughout the tenement area.</li> <li>All Of Concern REs are afforded "High" State Ecosystem Value. Areas mapped under this category include linear strips with some adjacent larger patches following Myranga and Homebush Roads. Large areas occur along watercourses within the tenement area including Dulacca Creek (south of Warrego Highway), Wallan Creek and Tchanning Creek. Other isolated fragments occur, throughout the tenement area north of Warrego Highway.</li> </ul> <p>The remaining REs are mapped as being of "Medium" State Ecosystem Value.</p>
<b>B2 Rating - Regional Ecosystem Value</b>
Remnant vegetation mapped as "Very High Conservation Value" are scattered throughout the tenement area including: along Warrego Highway, Myranga Road, Wallan Creek and Drillham Creek (south of Warrego Highway). Remnants of "High Conservation Value" are scattered north of Warrego Highway including along Homebush Road. The remaining remnants within the tenement area are mapped as "Moderate Conservation Value".
<b>C Rating - Tract Size</b>
Within the tenement area most of the remnant vegetation is mapped as "Very High" or "High" value tracts. "Very High" value tracts are located adjacent to Gurulmundi SF in the north-west, in the south-east extremity, north-west extremity



<b>CARINYA TENEMENT - Mapping and Expert Panel Results</b>
and along Dulacca Creek. "High" value tracts are scattered throughout the tenement area.
<b>D1 Rating - State Relative Ecosystem Size</b>
Much of the tenement area is mapped as "Low" or "Medium" value. However, large tracts of vegetation including and adjacent to Gurulmundi SF in the north of the tenement area have been mapped as "Very High" or "High" value.
<b>D2 Rating - Regional Relative Ecosystem Size</b>
"Very High" and "High" value tracts are located adjacent to Gurulmundi SF in the north-west, in the south-east extremity, along the western extremity and along Dulacca, Wallan and Drillham Creeks. "Low" and "Moderate" value tracts are scattered throughout the tenement area.
<b>E Rating - Condition</b>
All mapped REs within the Study Area are afforded a "Very High" condition rating.
<b>F Rating - Ecosystem Diversity</b>
Areas mapped as having "Very High" or "High" Ecosystem Diversity are located adjacent to, and including Gurulmundi SF (north-east), along Warrego Highway and in the south-east and north-east extremities of the tenement area. The remaining areas are mapped as having "Medium" or "Low" Ecosystem Diversity.
<b>G Rating - Context and connection</b>
The majority of the tenement area is mapped as having "Low" or "Medium" value under this category. Small areas mapped as "Very High" or "High" are scattered throughout the tenement area, however large tracts are located adjacent to, and including Gurulmundi SF (north-east corner of tenement area).
<b>H Rating - Core Habitat for Priority Taxa</b>
No habitat within the tenement area has been designated under this category.
<b>I Rating - Special Biodiversity values</b>
<i>Core Areas:</i> Based on Tract Size analysis (criterion C), the expert panel identified core areas for the southern Brigalow Belt to be of State significance ("Very High" Special Biodiversity Values – refuge from clearing). Much of the vegetation west of Jackson Wandoan Road in the north-west of the tenement area has been mapped as part of the Yuleba Core Area.
<i>Fragmented sub-regions (State):</i> The expert panel designated fragmented remnants (in subregions with less than 30% remnant vegetation) to be of State significance ("Very High" Special Biodiversity Values – refuge from clearing), when containing the largest remaining examples of an RE within a subregion. Much of the remnant vegetation around the boundary of the tenement area and along creeklines is mapped under this category.
<i>Fragmented sub-regions (Regional):</i> The expert panel designated fragmented remnants to be of Regional significance ("High" Special Biodiversity Values – refuge from clearing), in subregions with less than 30% remnant vegetation. Much of the vegetation within the tenement area is mapped under this category.
<i>Fragmented sub-regions (stockroutes and road reserves):</i> Stockroutes and associated reserves provide critical connectivity in fragmented landscapes. The expert panel designated these areas as of State significance ("Very High" Special Biodiversity Values – refuge from clearing) in subregions with less than 30% remnant vegetation. Road Reserves adjacent to Warrego Highway, Bogandilla Road, Dulacca South Road, Myangra Road and Homebush Road are mapped under this category.
<i>Gurulmundi:</i> This is an area of diverse habitat types including shrubland on rock pavement, acacia thickets, mixed eucalypt slopes, cypress pine woodland and vine thickets. The area provides habitat for EVR plant taxa and localized endemics. Designated as of "State" significance (Special Biodiversity Values: centre of endemism; disjunct populations; geographic range limits; and high species richness). Vegetation mapped under this category is restricted to the extreme north-east corner of the tenement area adjacent to and including areas of Gurulmundi SF.
<b>J Rating - Corridors</b>
<i>Terrestrial Bioregional Corridor:</i> Within the tenement area remnant vegetation in the north-east and north-west has been designated as of "State" significance as a Terrestrial Bioregional Corridor by the expert panel.
<b>Bio_Sig - Biodiversity Significance</b>
The majority of REs mapped for the tenement area are rated as "State" significant with one tracts mapped as "State Significant for EVR Taxa" within and adjacent to Gurulmundi SF (north-east). REs mapped as "Regionally" significant are scattered throughout the tenement area. Areas located in the extreme south-east of the tenement area are designated as "Local or other values" in this category.

### D.3.7 DALWOGAN TENEMENT

The Dalwogan Tenement covers an area of approximately 225 km<sup>2</sup>. The tenement is located between the Condabri tenement (east) and Carinya tenement (west). The eastern boundary is approximately 2 km west of the

town of Miles (**Figure D.1**). Topography is predominantly gently undulating, increasing to moderately undulating north of the Warrego Highway. Major habitat features include several creeks including Eleven Mile Creek, Wallan Creek (both north of the Warrego Highway), Paddy Creek and Tomahan Gully (both south of

the Warrego Highway). The tenement retains a substantial coverage of vegetation despite no land being incorporated within State Forest. The tenement is contained within Barakula subregion (27) within the Brigalow Belt South Bioregion.

**Table D.8** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.2** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.8. Dalwogan Tenement BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>DALWOGAN TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
Much of the tenement area has been mapped as “Low” value for EVR taxa. The north-east corner of the tenement area and an area in the east (close to the town of Miles) is mapped as “Medium” value for EVR taxa.
<b>B1 Rating - State Ecosystem Value</b>
Scattered small Regional Ecosystems within the tenement area are mapped as having “Very High” or “High” State Ecosystem Value for the following reasons:
<ul style="list-style-type: none"> <li>All Endangered REs within the tenement area are mapped as having “Very High” State Ecosystem Value. Within the Study Area three small remnants in the north have been designated under this value.</li> <li>All Of Concern REs are afforded “High” State Ecosystem Value. Within the tenement area these REs follow watercourses including Eleven Mile Creek, Wallan Creek (both in northern section of Study Area), Paddy Creek and Dogwood Creek (both located in the south-west).</li> </ul>
The remaining REs are mapped as being of “Medium” State Ecosystem Value.
<b>B2 Rating - Regional Ecosystem Value</b>
Small remnants mapped as “Very High Conservation Value” are scattered through the north of the tenement area including part of Wallan creek. Remnants mapped as “High Conservation Value” are restricted to creeklines in the north of the tenement area (Eleven Mile Creek and part of Wallan creek) and along Paddy Creek in the south. The remaining remnants within the tenement area are mapped as “Moderate Conservation Value”.
<b>C Rating - Tract Size</b>
Within the tenement area most of the remnant vegetation is mapped as “Very High” value tracts. Several small tracts are designated “Low” and “Medium” value and are scattered throughout the tenement area.
<b>D1 Rating - State Relative Ecosystem Size</b>
Much of the area is mapped as “Low” or “Medium” value. A single large tract of vegetation in the north-east of the Study Area has been mapped as “Very High” value.
<b>D2 Rating - Regional Relative Ecosystem Size</b>
“Very High” value remnants have been mapped in the north-east corner of the tenement area, along Paddy Creek and parts of Eleven Mile and Wallan Creeks. A single large tract has been mapped as “High” value and is located north of the Warrego Highway in the tenement area. All other vegetation in the tenement area is mapped as “Low” or “Medium” value remnants.
<b>E Rating - Condition</b>
All mapped REs within the tenement area are afforded a “Very High” condition rating.
<b>F Rating - Ecosystem Diversity</b>
Large sections of the tenement area are mapped as having “Very High” or “High” Ecosystem Diversity. “Very High” areas are located directly to the east of the Leichhardt Highway and along Wallan Creek and parts of Eleven Mile Creek. The majority of remaining REs are rated as having “High” Ecosystem Diversity. Areas of “Medium” or “Low” Ecosystem Diversity are mapped in the northern and southern extremes of the tenement area.
<b>G Rating - Context and connection</b>
Remnants mapped as “Very High” and “High” value occupy a large central portion of the tenement area (north of Warrego Highway). Scattered smaller remnants mapped as “Very High” value are scattered throughout. Larger remnants of “High” value are located east of Paddy Creek in the south and north of Wallan Creek (northern part of tenement area). The remaining vegetation is largely mapped as “Medium” value.
<b>H Rating - Core Habitat for Priority Taxa</b>
This criterion is used to identify essential and general habitat for EVR and other priority taxa in addition to diagnostic criterion A. No habitat within the tenement area is mapped under this category.
<b>I Rating - Special Biodiversity values</b>
<b>Core Areas:</b> Based on Tract Size analysis (criterion C), the expert panel identified core areas for the southern Brigalow Belt to be of State significance (“Very High” Special Biodiversity Values – refuge from clearing). All of the vegetation in the north-east of the tenement area, along Paddy Creek (southern) and parts of Eleven Mile and Wallan Creeks are mapped under this category.

<b>DALWOGAN TENEMENT - Mapping and Expert Panel Results</b>
<i>Fragmented sub-regions (Regional):</i> The expert panel designated fragmented remnants to be of Regional significance ("High" Special Biodiversity Values – refuge from clearing), in subregions with less than 30% remnant vegetation. One small remnant in the extreme south of the tenement area is mapped under this category.
<i>Fragmented sub-regions (stockroutes and road reserves):</i> Road Reserves adjacent to Warrego Highway are mapped under this category.
<i>Gurulmundi:</i> This is an area of diverse habitat types including shrubland on rock pavement, acacia thickets, mixed eucalypt slopes, cypress pine woodland and vine thickets. The area provides habitat for EVR plant taxa and localized endemics. Designated as of "State" significance (Special Biodiversity Values: centre of endemism; disjunct populations; geographic range limits; and high species richness). Vegetation mapped under this category is restricted to the extreme north-west corner of the tenement area.
<b>J Rating - Corridors</b>
None of the vegetation within the tenement area is mapped under this category.
<b>Bio_Sig - Biodiversity Significance</b>
REs mapped as "State" significant are located along parts of Eleven Mile and Wallan Creeks, along Paddy Creek (south-east) and the Warrego Highway. REs mapped as "Regionally" significant are scattered throughout the tenement area but are concentrated in vegetation directly west of the Leichhardt Highway and along Wallan and Eleven Mile Creeks. The remaining vegetation has been designated under "Local or other values" for this category.

### D.3.8 GILBERT GULLY TENEMENT

The Gilbert Gully tenement is an irregularly shaped area covering approximately 1280 km<sup>2</sup>. The tenement extends 55 km between the Moonie Highway (north) to the Gore Highway (south). The eastern boundary is approximately 18 km east of Milmeran extending a further 24 km west (**Figure D.1**). The topography is largely undulating hilly country rising in altitude from west to east. Much of the tenement still retains continuous native vegetation associated

with Kumberilla, Dunmore and Western Creek State Forests (SF). Major waterways include Weir River, Tea Tree Creek, Western Creek and Scrubby Creek. The tenement is contained entirely within Inglewood Sandstones subregion (32) within the Brigalow Belt South Bioregion.

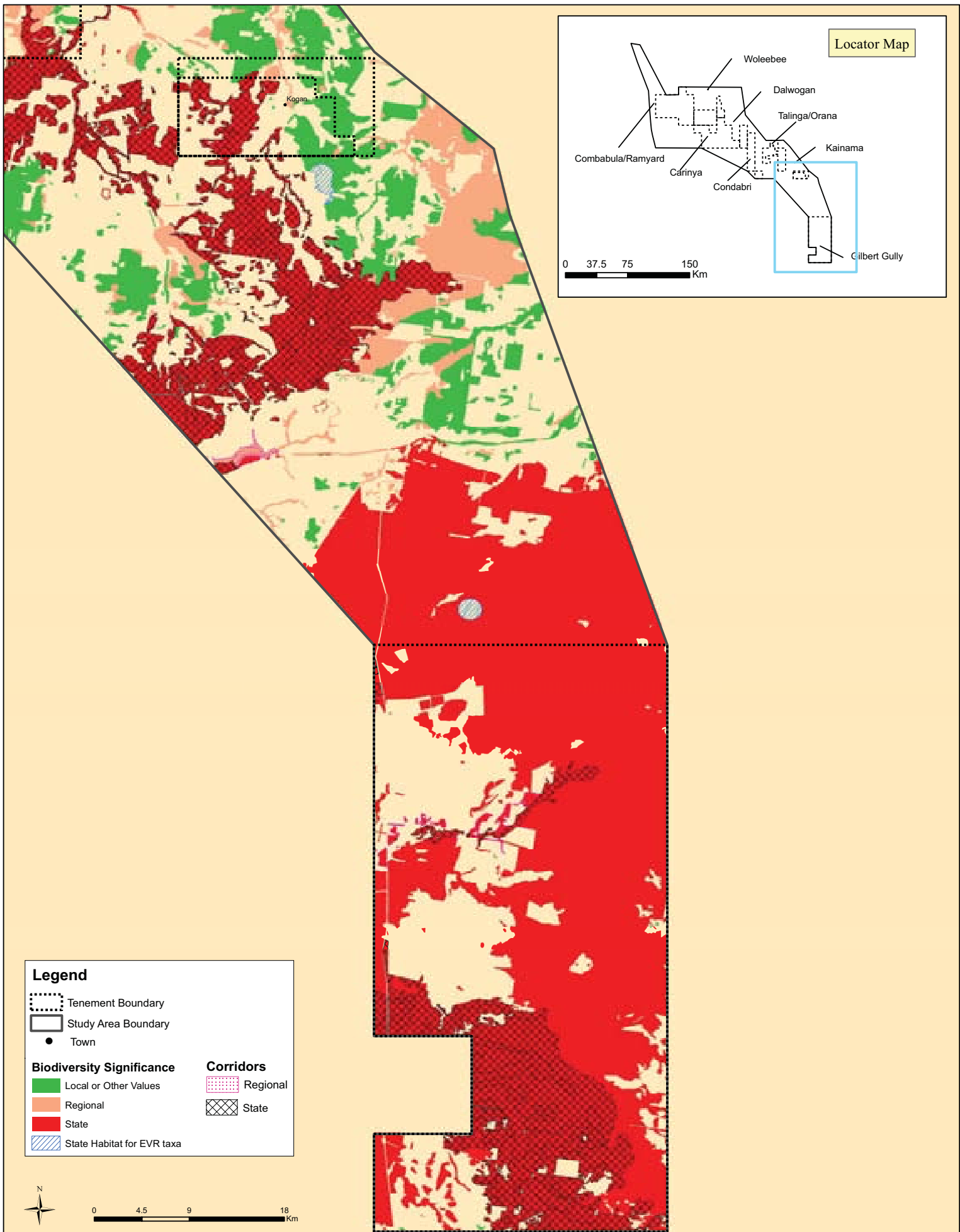
**Table D.9** sets out the results of BPA mapping and the relevant findings of the expert panels for flora, fauna and landscape (EPA 2008a,b,c). **Figure D.1** shows the results of the Biodiversity Significance mapping within the tenement.

**Table D.9. Gilbert Gully Tenement BPA Results and Expert Panel Information (EPA 2008a,b,c)**

<b>GILBERT GULLY TENEMENT - Mapping and Expert Panel Results</b>
<b>A Rating - Habitat for EVR Taxa</b>
Most of the vegetation in the tenement has been mapped as 'Low' and "medium" value for EVR taxa. Large "Medium" value tracts occupy areas in the north and central portions of the tenement. Several areas mapped as "High" value habitat under this category are scattered throughout the tenement but are concentrated in the north within or adjacent to State Forest areas. Remnants are designated as having "High" value when the unit has precise record/s or core habitat for one Vulnerable taxon or one Rare taxon. All "High" value habitats within the tenement appear to be based on EVR records. Within or adjacent to Kumberilla SF (northern section of tenement) there are records for EVR fauna including Golden-tailed Gecko <i>Strophurus taenicauda</i> (formerly Rare, now Near Threatened – NC Act); Brigalow Scaly-foot <i>Paradelma orientalis</i> (Vulnerable – NC Act); and northern subspecies of Imperial Hairstreak <i>Jalmenus evagoras eubulus</i> (Vulnerable – NC Act). Further south (within or adjacent to Western Creek SF) there are records for plant taxa: <i>Gonocarpus urceolatus</i> and <i>Philothea sporadica</i> (both Vulnerable – NC Act), as well as Large-eared Pied Bat <i>Chalinolobus dwyeri</i> (formerly Rare, now Vulnerable – NC Act).
<b>B1 Rating - State Ecosystem Value</b>
Most of the vegetation within the tenement area is mapped as "Medium" value under this category. Scattered Regional Ecosystems within the tenement mapped as having "Very High" or "High" State Ecosystem Value for the following reasons: <ul style="list-style-type: none"> <li>All Endangered REs within the tenement area are mapped as having "Very High" State Ecosystem Value. Small areas mapped under this category are scattered throughout the tenement area with a concentration in the south-east (south of Western Creek SF).</li> <li>All Of Concern REs are afforded "High" State Ecosystem Value. Areas mapped under this category largely include vegetation along or adjacent to creeklines. Waterways mapped under this category include Paddy and Nine Mile</li> </ul>



<b>GILBERT GULLY TENEMENT - Mapping and Expert Panel Results</b>
<p>Creeks (south-east); Weir River and associated tributaries (central-west); and Western Creek and associated tributaries (east).</p> <p>REs that are of “No Concern at Present” with 30-50% of the original extent remaining, REs that are poorly conserved within the bioregion and remnant vegetation with &lt;30% subdominant Endangered or Of Concern REs are mapped as being of “Medium” State Ecosystem Value.</p>
<b>B2 Rating - Regional Ecosystem Value</b>
<p>Most of the vegetation within the tenement is mapped as “Medium” value under this category. Small areas mapped as “Very High Conservation Value” are scattered throughout the tenement area with a concentration in the south-east (south of Western Creek SF). Remnants mapped as “High Conservation Value” largely include vegetation along or adjacent to creeklines including sections of tributaries of Weir River (central-west); and Western Creek and associated tributaries (east).</p>
<b>C Rating - Tract Size</b>
<p>Most of the remnant vegetation is mapped as “Very High” value tracts. Large isolated “High” value tracts are scattered through the east of the tenement.</p>
<b>D1 Rating - State Relative Ecosystem Size</b>
<p>Large tracts of vegetation spread through State Forest areas and south of Gore Highway (south-east) are mapped as “Very High” value. “High” value remnants are located along or adjacent to Scrubby Creek and Nine Mile Creek in the south of the tenement area. The remainder of the tenement area is mapped as “Low” or “Medium” value REs.</p>
<b>D2 Rating - Regional Relative Ecosystem Size</b>
<p>Large tracts of vegetation spread through State Forest areas as well as north and south of Gore Highway (south-east) are mapped as “Very High” under this category. Large “High” value remnants are located along or adjacent to Scrubby Creek in the south-west, and Weir River, Scrubby Creek and Gilbert Gully in the north of the tenement area. The remainder of the tenement area is mapped as “Low” or “Medium” value REs.</p>
<b>E Rating - Condition</b>
<p>All mapped REs within the tenement area are afforded a “Very High” condition rating.</p>
<b>F Rating - Ecosystem Diversity</b>
<p>Much of the tenement area is mapped as having “High” Ecosystem Diversity. Areas mapped as “Very High” remnants are mainly along or adjacent to waterways including: Weir River, Tea Tree Gully and Waggaba Creek in the north; and remnants of Western Creek and tributaries. There are also two large remnants mapped as “Very High” directly north of Gore Highway. Much of the remaining area is mapped as having “Medium” Ecosystem Diversity with scattered small remnants of “Low” value.</p>
<b>G Rating - Context and connection</b>
<p>Due to the continuous nature of vegetation cover in the tenement and surrounds, the majority of vegetation within the tenement area is mapped as having “Very High” value under this category. Some areas mapped as “High” value are also scattered throughout the tenement area.</p>
<b>H Rating - Core Habitat for Priority Taxa</b>
<p>Large areas of habitat within the north of the tenement are mapped as “Medium” value for Koala <i>Phascolarctos cinereus</i>. Sections of habitat along Weir River are mapped as “Medium” value for Barking Owl <i>Ninox connivens</i>. Two small areas in the north-east of the tenement have been designated as “High” value under this category for priority plant taxa. Within the Expert Panel Report (2008) these areas have been assigned BPA ID codes of brbs_fl_101 and brbs_fl_103 (indicating Regional significance), however the plant species identified is not clear. In addition four isolated areas to the south have been designated “Medium” value for priority plant taxa (BPA ID: brbs_fl_103; Regional significance).</p>
<b>I Rating - Special Biodiversity values</b>
<p><b>Core Areas:</b> Based on Tract Size analysis (criterion C), the expert panel identified core areas for the southern Brigalow Belt to be of State significance (“Very High” Special Biodiversity Values – refuge from clearing). All vegetation within the tenement has been mapped as part of the Inglewood Sandstones Core Area.</p>
<b>J Rating - Corridors</b>
<p><b>Terrestrial Bioregional Corridor:</b> Within the south of the tenement area remnant vegetation connecting (and including) Western Creek SF to protected areas south of the tenement has been designated as of “State” significance as a Terrestrial Bioregional Corridor by the expert panel.</p> <p><b>Riparian Bioregional Corridor:</b> Remnant vegetation along Weir River has been afforded “State” significance as a Riparian Bioregional Corridor. Several remnants adjacent to Weir River have been afforded “Regional” significance under the same category.</p>
<b>Bio_Sig - Biodiversity Significance</b>
<p>All of the vegetation mapped for the tenement area is rated as “State” significant.</p>



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**Figure D.1**

Biodiversity Planning Assessment (BPA) Mapping -  
Biodiversity Significance and Corridors  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS

## 1.5 Terrestrial Flora Results

The methodology adopted for the terrestrial flora assessment is provided in detail in Appendix A. Key tasks included:

A desktop review of relevant data sources, including publicly available databases, and environmental mapping and planning documentation

A comprehensive review of available literature relevant to the terrestrial vegetation and flora of the study area

Project-specific ground surveys, including targeted searches for significant terrestrial flora species undertaken between 22<sup>nd</sup> April and 8<sup>th</sup> May 2009, and subsequent surveys undertaken between 27<sup>th</sup> July to 28<sup>th</sup> September 2009 for the verification of existing vegetation mapping and associated habitat values

Project-specific vegetation mapping based on existing vegetation mapping and refined on the basis of recently flown aerial photography and data collected during the 2009 ground surveys and from other reliable sources

Identification of available habitat for significant flora species based on associated vegetation communities and determined via consultation with an expert panel convened specifically for the project, including Mr Craig Eddie (Managing Director of Boobook and contractor to Australia Pacific LNG), Mr Paul Grimshaw (Principal Botanist of BAAM), Mr Tim Low (Principal Ecologist and subconsultant to BAAM), Dr Andrew Daniel (Director and Principal Ecologist of BAAM) and Derek Johnson (Managing Director of QTree and subconsultant to BAAM).

For consistency, this report follows the nomenclature provided by Bostock and Holland (2007) in relation to flora species.

### 1.5.1 Existing Desk Top Information

This section provides a summary of currently recognised ecological values known or potentially occurring within the study area in terms of terrestrial flora species and communities. Where necessary, this information is revised or refined in Section 2.3.2, based on the results of the 2009 ground surveys and interpretation of recently flown aerial photography.

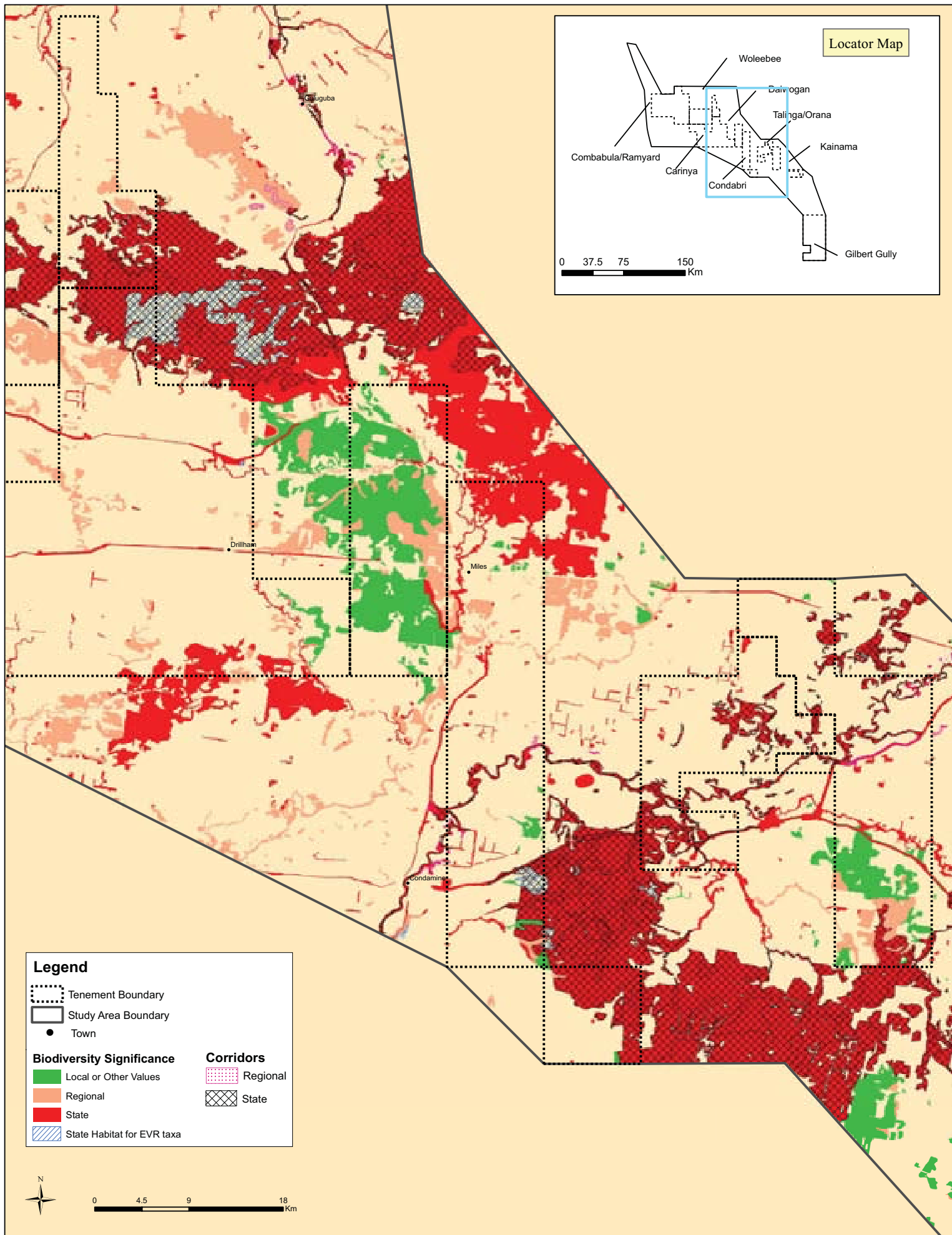
#### ***EPBC Act - Protected Matters***

The EPBC Act Online Protected Matters Search Tool results (DEWHA 2009a) provided in Appendix E indicate that six threatened ecological communities and 33 terrestrial flora species of special conservation significance listed under the EPBC Act may occur within the study area, including two critically endangered and four endangered ecological communities, five endangered species and 28 vulnerable species.

Due to difficulties associated with the shape of the study area and restrictions imposed by the EPBC Act Online Protected Matters Search Tool, the area searched for this component of the desk top assessment includes areas well outside of the study area, particularly to the north-east and south-west. Consequently, the actual or potential occurrence of these communities and species within the study area is discussed further in Section 2.3.2, following consideration of the findings from recent ground surveys and vegetation mapping refinements.

Several wetlands of national importance occur within the Condamine-Balonne river catchment, of which two – Lake Broadwater (located 25km south-west of Dalby) and the Balonne River Floodplain complex, including the Ramsar listed Narran Lakes in the lower Balonne (approximately 500km downstream of the proposed gas fields) – are relevant to the





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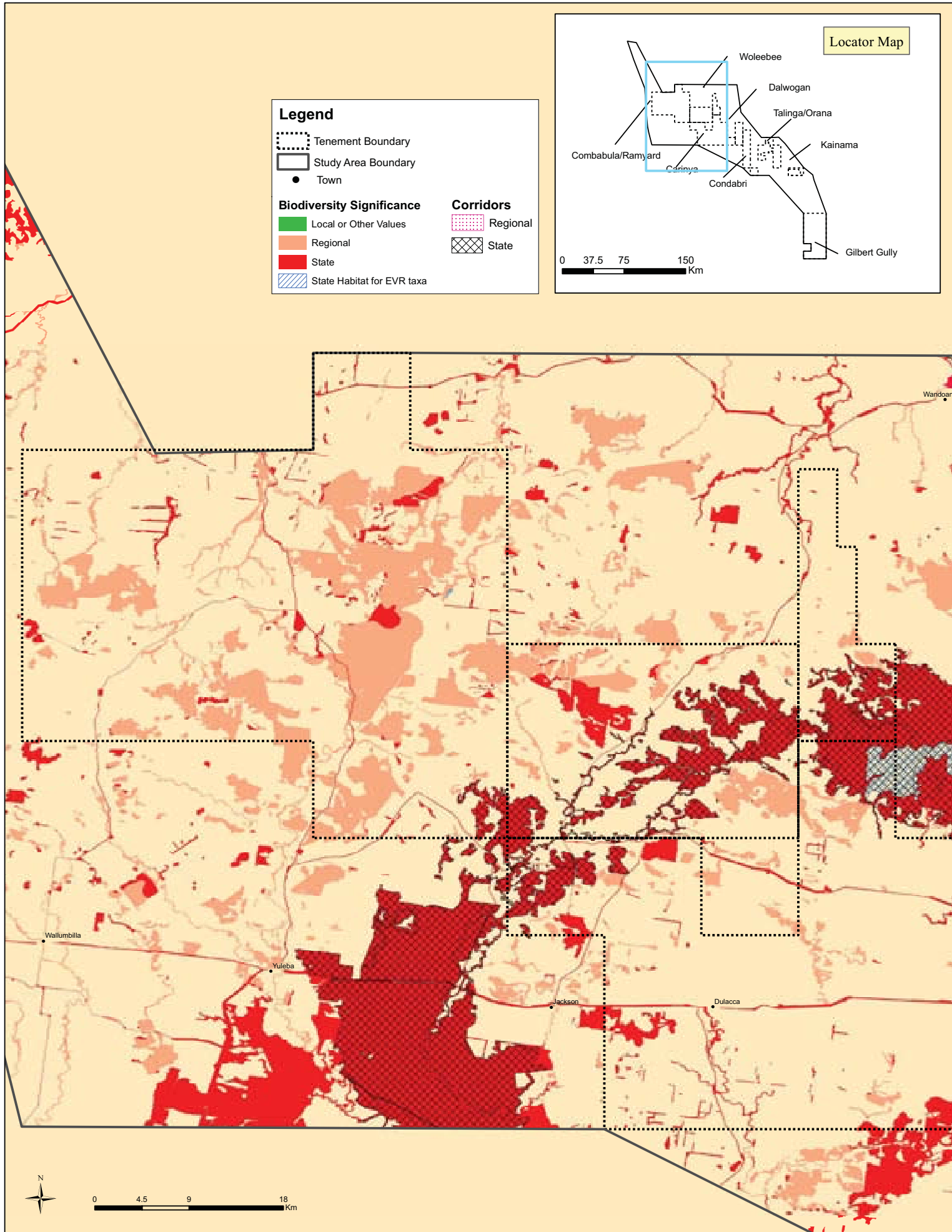
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**Figure D.2**

**Biodiversity Planning Assessment (BPA) Mapping - Biodiversity Significance and Corridors**

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



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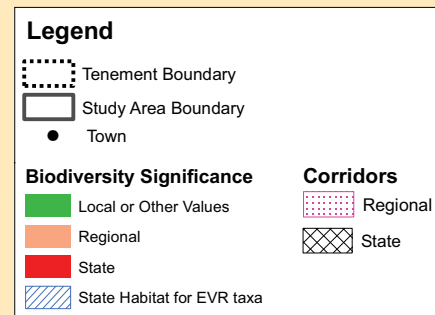
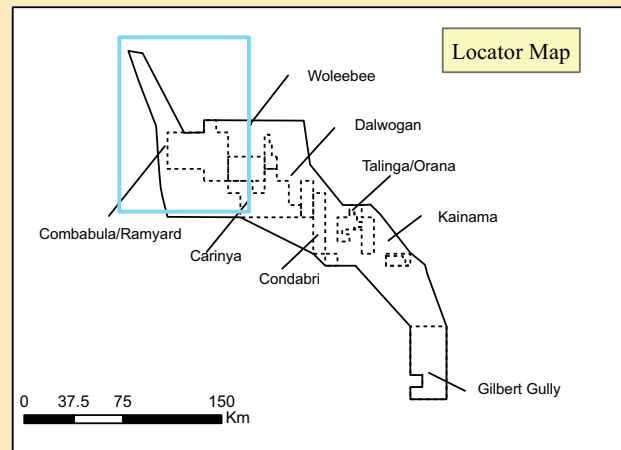
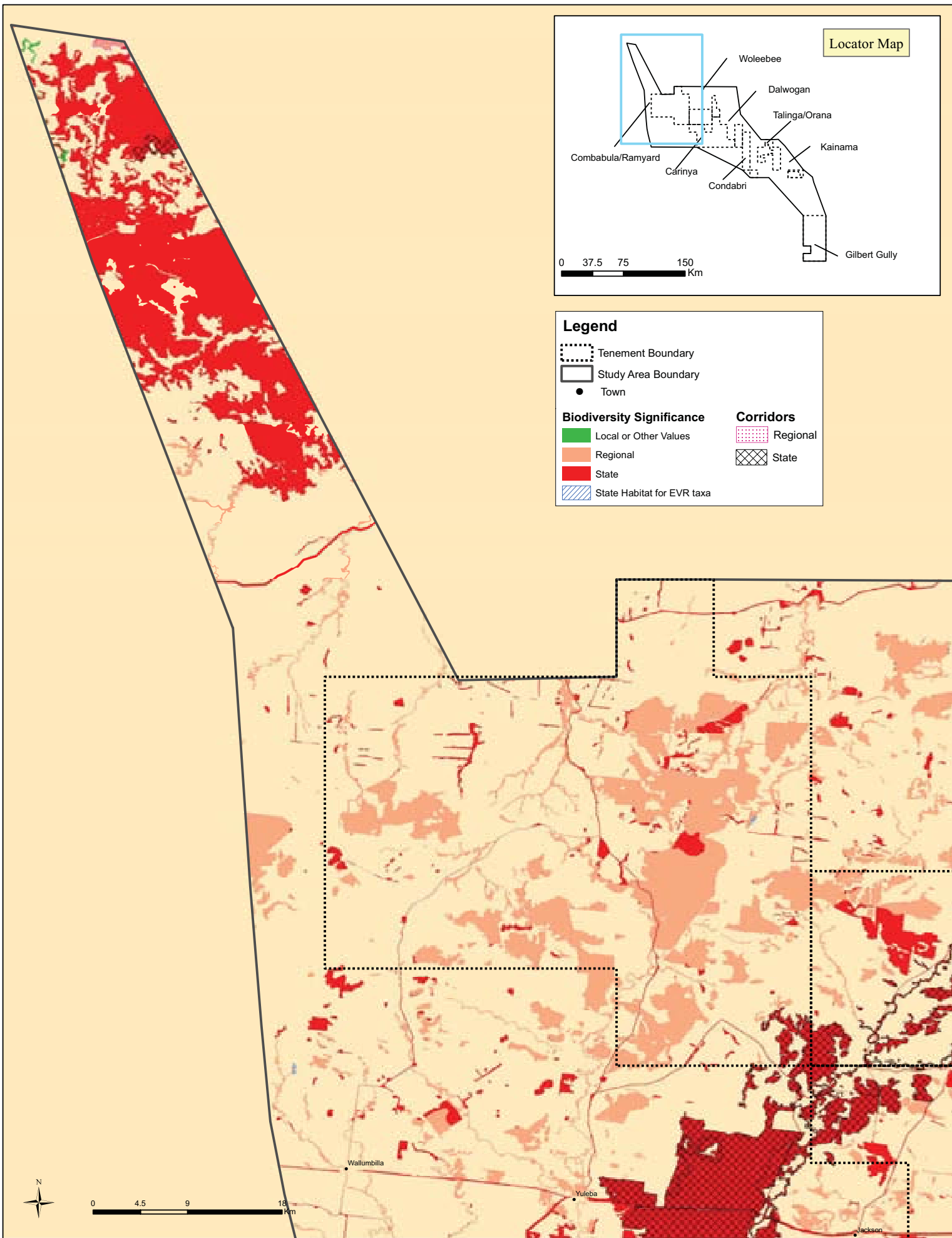
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**Figure D.3**

Biodiversity Planning Assessment (BPA) Mapping - Biodiversity Significance and Corridors  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS



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**Figure D.4**

Biodiversity Planning Assessment (BPA) Mapping - Biodiversity Significance and Corridors  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS



## D.4 REFERENCES

- EPA (2002).** 'Biodiversity Assessment and Mapping Methodology.' Environment Protection Agency, Biodiversity Planning Unit, Biodiversity Branch Version 2.1 July 2002.
- EPA (2008a).** 'Brigalow Belt South Flora Expert Panel Report.' Environmental Protection Agency. October 2002. Revised and updated June 2008.
- EPA (2008b).** 'Brigalow Belt South Fauna Expert Panel Report.' Environmental Protection Agency – Southwest Queensland. September 2002. Revised and updated June 2008.
- EPA (2008c).** 'Brigalow Belt South Landscape Expert Panel Report.' Environmental Protection Agency. August 2002. Revised and updated June 2008.

**Appendix E:**  
**EPBC Act Online Protected Matters Search Tool Results**

## Protected Matters Search Tool

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

25 September 2009 08:37

# 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>

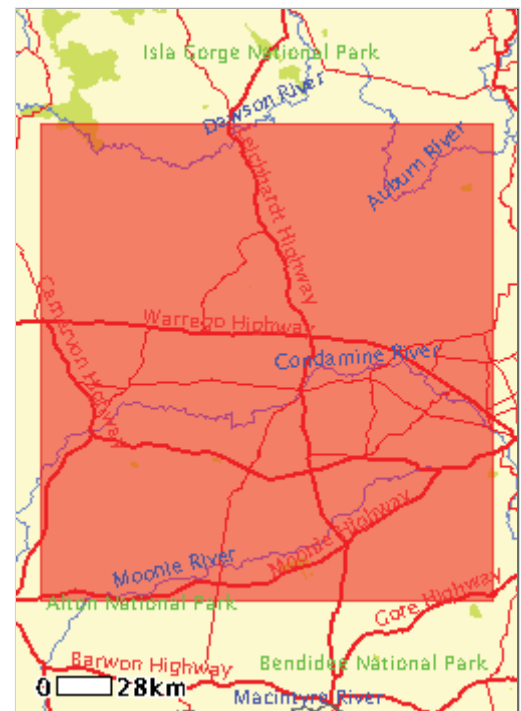
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-28.00888,151.1163, -28.00888,148.8083



**Report Contents:** [Summary](#)  
[Details](#)

- [Matters of NES](#)
- [Other matters protected by the EPBC Act](#)
- [Extra Information](#)

[Caveat](#)  
[Acknowledgments](#)



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## 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>.

<b>World Heritage Properties:</b>	None
<b>National Heritage Places:</b>	None
<b><u>Wetlands of International Significance:</u></b> <b>(Ramsar Sites)</b>	2
<b>Commonwealth Marine Areas:</b>	None
<b><u>Threatened Ecological Communities:</u></b>	6
<b><u>Threatened Species:</u></b>	55
<b><u>Migratory Species:</u></b>	21

## 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>.

<b>Commonwealth Lands:</b>	None
<b>Commonwealth Heritage Places:</b>	None
<b><u>Places on the RNE:</u></b>	11
<b><u>Listed Marine Species:</u></b>	22
<b>Whales and Other Cetaceans:</b>	None
<b>Critical Habitats:</b>	None
<b>Commonwealth Reserves:</b>	None

## Extra Information

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



<b><u>State and Territory Reserves:</u></b>	17
<b>Other Commonwealth Reserves:</b>	None
<b>Regional Forest Agreements:</b>	None

## Details

## Matters of National Environmental Significance

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

<a href="#">NARRAN LAKE NATURE RESERVE</a>	Within same catchment as Ramsar site
<a href="#">SHOALWATER AND CORIO BAYS AREA</a>	Within same catchment as Ramsar site

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

	Status	Type of Presence
<a href="#">Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)</a>	Endangered	Community known to occur within area
<a href="#">Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland</a>	Critically Endangered	Community likely to occur within area
<a href="#">Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions</a>	Endangered	Community likely to occur within area
<a href="#">The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin</a>	Endangered	Community known to occur within area
<a href="#">Weeping Myall Woodlands</a>	Endangered	Community likely to occur within area
<a href="#">White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</a>	Critically Endangered	Community may occur within area

Threatened Species [ [Dataset Information](#) ]

### Birds

<a href="#">Anthochaera phrygia</a> Regent Honeyeater	Endangered	Species or species habitat may occur within area
<a href="#">Erythrorhynchus radiatus</a> Red Goshawk	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Geophaps scripta scripta</a> Squatter Pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot	Endangered	Species or species habitat likely to occur within area
<a href="#">Neochmia ruficauda ruficauda</a> Star Finch (eastern), Star Finch (southern)	Endangered	Species or species habitat likely to occur within area
<a href="#">Polytelis swainsonii</a> Superb Parrot	Vulnerable	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
<a href="#">Turnix melanogaster</a> Black-breasted Button-quail	Vulnerable	Species or species habitat likely to occur within area

### Lungfishes

[\*Neoceratodus forsteri\*](#)

Australian Lungfish, Queensland Lungfish

Vulnerable Species or species habitat likely to occur within area

**Mammals**[\*Chalinolobus dwyeri\*](#)

Large-eared Pied Bat, Large Pied Bat

Vulnerable Species or species habitat may occur within area

[\*Dasyurus hallucatus\*](#)

Northern Quoll

Endangered Species or species habitat known to occur within area

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

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

Endangered Species or species habitat may occur within area

[\*Nyctophilus timoriensis\*](#)

Greater Long-eared Bat

Vulnerable Species or species habitat may occur within area

[\*Pteropus poliocephalus\*](#)

Grey-headed Flying-fox

Vulnerable Species or species habitat may occur within area

**Ray-finned fishes**[\*Maccullochella peelii peelii\*](#)

Murray Cod, Cod, Goodoo

Vulnerable Species or species habitat may occur within area

**Reptiles**[\*Anomalopus mackayi\*](#)

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

Vulnerable Species or species habitat may occur within area

[\*Denisonia maculata\*](#)

Ornamental Snake

Vulnerable Species or species habitat likely to occur within area

[\*Egernia rugosa\*](#)

Yakka Skink

Vulnerable Species or species habitat likely to occur within area

[\*Furina dunmalli\*](#)

Dunmall's Snake

Vulnerable Species or species habitat may occur within area

[\*Paradelma orientalis\*](#)

Brigalow Scaly-foot

Vulnerable Species or species habitat likely to occur within area

[\*Rheodytes leukops\*](#)

Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle

Vulnerable Species or species habitat may occur within area

[\*Tympanocryptis pinguicolla\*](#)

Grassland Earless Dragon

Endangered Species or species habitat may occur within area

**Plants**[\*Acacia chinchillensis\*](#)

Vulnerable Species or species habitat likely to occur within area

[\*Acacia curranii\*](#)

Curly-bark Wattle

Vulnerable Species or species habitat likely to occur within area

[\*Acacia grandifolia\*](#)

Vulnerable Species or species habitat likely to occur within area

[\*Acacia handonis\*](#)

Hando's Wattle, Percy Grant Wattle

Vulnerable Species or species habitat likely to occur within area

[\*Acacia lauta\*](#)

Vulnerable Species or species habitat likely to occur within area

[\*Acacia wardellii\*](#)

Vulnerable Species or species habitat may occur within area

<a href="#"><i>Bothriochloa biloba</i></a> Lobed Blue-grass	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Cadellia pentastylis</i></a> Ooline	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Calytrix gurlmundensis</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Commersonia argentea</i></a> a shrub	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Denhamia parvifolia</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Dichanthium queenslandicum</i></a> King Blue-grass	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Digitaria porrecta</i></a> Finger Panic Grass	Endangered	Species or species habitat likely to occur within area
<a href="#"><i>Diuris sheaffiana</i></a> Tricolour Diuris	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Eriocaulon carsonii</i></a> Salt Pipewort, Button Grass	Endangered	Species or species habitat likely to occur within area
<a href="#"><i>Eucalyptus argophloia</i></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="#"><i>Eucalyptus beaniana</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Eucalyptus virens</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Haloragis exalata subsp. velutina</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Homopholis belsonii</i></a>	Vulnerable	Species or species habitat may occur within area
<a href="#"><i>Homoranthus decumbens</i></a>	Vulnerable	Species or species habitat known to occur within area
<a href="#"><i>Macrozamia fearnsidei</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Microcarpaea agonis</i></a>	Endangered	Species or species habitat likely to occur within area
<a href="#"><i>Philothea sporadica</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Prostanthera sp. Dunmore (D.M.Gordon 84)</i></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Pterostylis cobarensis</i></a> Cobar Greenhood Orchid	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Rhaponticum australe</i></a> Austral Cornflower, Native Thistle	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Swainsona murrayana</i></a> Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><i>Thesium australe</i></a> Austral Toadflax, Toadflax	Vulnerable	Species or species habitat likely to occur within area

[illegible]



study area. Whilst Lake Broadwater is located outside of the gas field tenements, a small component of the proposed Gilbert Gully gas field is located within the catchment and may be connected to the lake via the floodplain during flood periods.

While not assessed as part of this study, the ecological significance of these areas (including the provision of habitat for terrestrial species such as migratory birds) has been well documented in available literature and on the Commonwealth Department of Environment, Water, Heritage and the Arts' (DEWHA's) website. No hydrological, water quality, and/or aquatic ecological impacts on these areas have been reported from the water management studies (Attachment 20 of Volume 5 of the EIS).

The study area is also located within one of twelve Great Artesian Basin spring Supergroup complexes – specifically the Springsure Supergroup, Brigalow Belt Complex. Numerous artesian springs are known to occur in the vicinity of the study area and have been assessed for potential impacts from the proposed gas fields development (Attachment 22, Volume 5, Australia Pacific LNG Project EIS).

### ***Certified Mapping of Remnant Vegetation and Essential Habitat***

The 1:100,000 certified RE mapping for the study area (Version 6) (DERM 2009a) is shown on Figures 2.3 and 2.4 and at a finer scale in Appendix F, with separate maps/map sets showing RE status under the VM Act and biodiversity status under the EP Act.

The certified mapping indicates 47 REs are currently mapped as occurring within the study area, as listed in Table 2.3. The REs mapped are contained within both homogeneous and heterogeneous polygons and cover an area of approximately 535,000ha, or around 36% of the study area. A refined assessment of remnant vegetation is provided in Section 2.3.2, based on the results of the 2009 ground surveys and the subsequent mapping exercise.

The existing certified RE mapping also indicates that the study area supports approximately 15,500ha (around 1% of the study area) of Essential Habitat for species listed under the provisions of the NC Act. These records and the essential habitat factors assigned for each species have been considered as part of the refined assessment of habitat for significant species provided in Sections 2.3.2 and 2.4.2.

### **Existing Vegetation Communities Overview**

The certified mapping suggests that by far the most widespread remnant vegetation communities within the study area are open forest and woodland communities that occur on poor, sandy soils. These soils are derived either from Mesozoic medium to large grained sandstones (Land Zone 10) or undulating Cainozoic plains and plateau remnants usually overlying duricrust, formed on deeply weathered surfaces (Land Zone 5). On land forms ranging from plateaus, scarps and hills to extensive, uniform near level or gently undulating Cainozoic plains, these communities are predominately vegetated by eucalypt open forests and woodlands characterised by the dominance of Narrow-leaved Red Ironbark *Eucalyptus crebra* (REs 11.5.1 and 11.5.4), Spotted Gum *Corymbia citriodora* subsp. *variegata* (11.10.1), Poplar Box *E. populnea* (11.5.1a), Silver-leaved Ironbark *E. melanophloia* (11.5.5), Inland Grey Box *E. microcarpa* or Narrow-leaved Box *E. pilligaensis* (11.5.20) or White Cypress Pine *Callitris glaucophylla* (11.5.4a).

Interspersed between these sandy soils are the remnants of Cainozoic lateritic duricrusts, forming low hills and ranges with shallow sandy soils (Land Zone 7) upon which eucalypt woodlands and open forests are dominated by Narrow-leaved Red Ironbark, Gum-topped Ironbark *Eucalyptus decorticans*, Brown Bloodwood *Corymbia trachyphloia* and White Cypress Pine (11.7.4), or Dusky-leaved Ironbark *Eucalyptus fibrosa* subsp. *nubila* (11.7.7) and Spotted Gum/Narrow-leaved Red Ironbark (11.7.6).

[\*Tylophora linearis\*](#)

Endangered	Species or species habitat known to occur within area
------------	---

[\*Westringia parvifolia\*](#)

Vulnerable	Species or species habitat likely to occur within area
------------	--

[\*Xerothamnella herbacea\*](#)

Endangered	Species or species habitat likely to occur within area
------------	--

[\*Zieria verrucosa\*](#)

Vulnerable	Species or species habitat likely to occur within area
------------	--

Migratory Species [ [Dataset Information](#) ]

Status	Type of Presence
--------	------------------

**Migratory Terrestrial Species****Birds**[\*Haliaeetus leucogaster\*](#)

White-bellied Sea-Eagle

Migratory	Species or species habitat likely to occur within area
-----------	--

[\*Hirundapus caudacutus\*](#)

White-throated Needletail

Migratory	Species or species habitat may occur within area
-----------	--

[\*Merops ornatus\*](#)

Rainbow Bee-eater

Migratory	Species or species habitat may occur within area
-----------	--

[\*Monarcha melanopsis\*](#)

Black-faced Monarch

Migratory	Species or species habitat may occur within area
-----------	--

[\*Myiagra cyanoleuca\*](#)

Satin Flycatcher

Migratory	Species or species habitat likely to occur within area
-----------	--

[\*Rhipidura rufifrons\*](#)

Rufous Fantail

Migratory	Breeding may occur within area
-----------	--------------------------------

[\*Xanthomyza phrygia\*](#)

Regent Honeyeater

Migratory	Species or species habitat may occur within area
-----------	--

**Migratory Wetland Species****Birds**[\*Ardea alba\*](#)

Great Egret, White Egret

Migratory	Breeding likely to occur within area
-----------	--------------------------------------

[\*Ardea ibis\*](#)

Cattle Egret

Migratory	Species or species habitat may occur within area
-----------	--

[\*Calidris acuminata\*](#)

Sharp-tailed Sandpiper

Migratory	Species or species habitat known to occur within area
-----------	---

[\*Calidris ferruginea\*](#)

Curlew Sandpiper

Migratory	Species or species habitat known to occur within area
-----------	---

[\*Gallinago hardwickii\*](#)

Latham's Snipe, Japanese Snipe

Migratory	Species or species habitat may occur within area
-----------	--

[\*Limosa limosa\*](#)

Black-tailed Godwit

Migratory	Species or species habitat known to occur within area
-----------	---

[\*Nettapus coromandelianus albigennis\*](#)

Australian Cotton Pygmy-goose

Migratory	Species or species habitat may occur within area
-----------	--

[\*Rostratula benghalensis s. lat.\*](#)

Painted Snipe

Migratory	Species or species habitat may occur within area
-----------	--

[\*Tringa glareola\*](#)

Wood Sandpiper

Migratory	Species or species habitat known to occur within area
-----------	---

[Tringa nebularia](#)

Common Greenshank, Greenshank

Migratory

Species or species habitat known to occur within area

[Tringa stagnatilis](#)

Marsh Sandpiper, Little Greenshank

Migratory

Species or species habitat known to occur within area

**Migratory Marine Birds**[Apus pacificus](#)

Fork-tailed Swift

Migratory

Species or species habitat may occur within area

[Ardea alba](#)

Great Egret, White Egret

Migratory

Breeding likely to occur within area

[Ardea ibis](#)

Cattle Egret

Migratory

Species or species habitat may occur within area

**Other Matters Protected by the EPBC Act**Listed Marine Species [ [Dataset Information](#) ]

Status

Type of Presence

**Birds**[Anseranas semipalmata](#)

Magpie Goose

Listed -  
overfly  
marine  
area

Species or species habitat may occur within area

[Apus pacificus](#)

Fork-tailed Swift

Listed -  
overfly  
marine  
area

Species or species habitat may occur within area

[Ardea alba](#)

Great Egret, White Egret

Listed -  
overfly  
marine  
area

Breeding likely to occur within area

[Ardea ibis](#)

Cattle Egret

Listed -  
overfly  
marine  
area

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper

Listed

Species or species habitat known to occur within area

[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 may 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

[\*Lathamus discolor\*](#)

Swift Parrot

Listed -  
overfly  
marine  
areaSpecies or species habitat likely to occur  
within area[\*Limosa limosa\*](#)

Black-tailed Godwit

Listed -  
overfly  
marine  
areaSpecies or species habitat known to occur  
within area[\*Merops ornatus\*](#)

Rainbow Bee-eater

Listed -  
overfly  
marine  
areaSpecies or species habitat may occur  
within area[\*Monarcha melanopsis\*](#)

Black-faced Monarch

Listed -  
overfly  
marine  
areaSpecies or species habitat may occur  
within area[\*Myiagra cyanoleuca\*](#)

Satin Flycatcher

Listed -  
overfly  
marine  
areaSpecies or species habitat likely to occur  
within area[\*Nettapus coromandelianus albipennis\*](#)

Australian Cotton Pygmy-goose

Listed -  
overfly  
marine  
areaSpecies or species habitat may occur  
within area[\*Recurvirostra novaehollandiae\*](#)

Red-necked Avocet

Listed -  
overfly  
marine  
areaSpecies 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  
areaSpecies or species habitat may occur  
within area[\*Tringa glareola\*](#)

Wood Sandpiper

Listed -  
overfly  
marine  
areaSpecies or species habitat known to occur  
within area[\*Tringa nebularia\*](#)

Common Greenshank, Greenshank

Listed -  
overfly  
marine  
areaSpecies or species habitat known to occur  
within area[\*Tringa stagnatilis\*](#)

Marsh Sandpiper, Little Greenshank

Listed -  
overfly  
marine  
areaSpecies or species habitat known to occur  
within areaPlaces on the RNE [ [Dataset Information](#) ]

Note that not all Indigenous sites may be listed.

**Historic**[Boonarga Cactoblastis Memorial Hall QLD](#)



## [Myall Park Botanic Garden QLD](#)

### **Indigenous**

## [Fernbank Stone Arrangement QLD](#)

## [Kogan Stone Arrangement QLD](#)

## [Malleroo Stone Arrangement QLD](#)

### **Natural**

## [Alton National Park QLD](#)

## [Auburn River National Park QLD](#)

## [Brigalow Invertebrate Site QLD](#)

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

## [Expedition Range Area QLD](#)

## [Southwood National Park QLD](#)

## **Extra Information**

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

Alton National Park, QLD

Auburn River National Park, QLD

Carraba Sandy Conservation Park, QLD

Coondarra Scientific Area, QLD

Erringibba Inlet National Park, QLD

Expedition National Park, QLD

Expedition Resource Reserve, QLD

Kapunn Scientific Area, QLD

Lake Broadwater Conservation Park, QLD

Lake Broadwater Resource Reserve, QLD

Rosehall Feature Protection Area, QLD

Singleton Scientific Area, QLD

Southwood National Park, QLD

Stones Country Resource Reserve, QLD

Unnamed Scientific Area, QLD

Waaaje Wildflower Scientific Area, QLD

Woolybark Scientific Area, QLD

---

## **Caveat**

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

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World 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

[ANUcliM 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](#)

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**Appendix F:**  
**Current DERM Certified Regional Ecosystem (VM Act**  
**Status and Biodiversity Status) and EPBC Act**  
**Endangered Ecological Community Mapping**

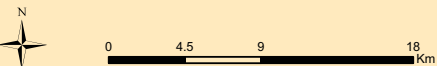
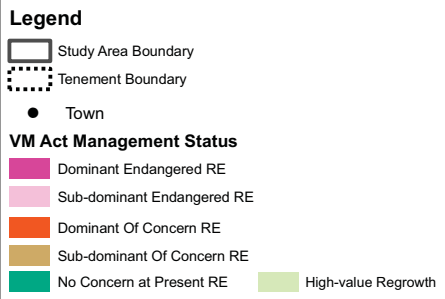
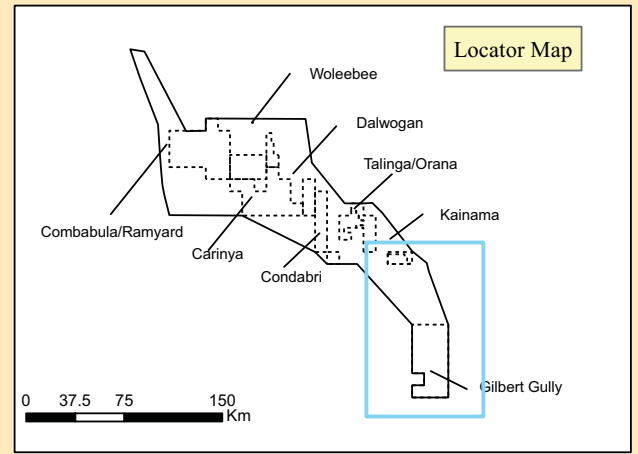
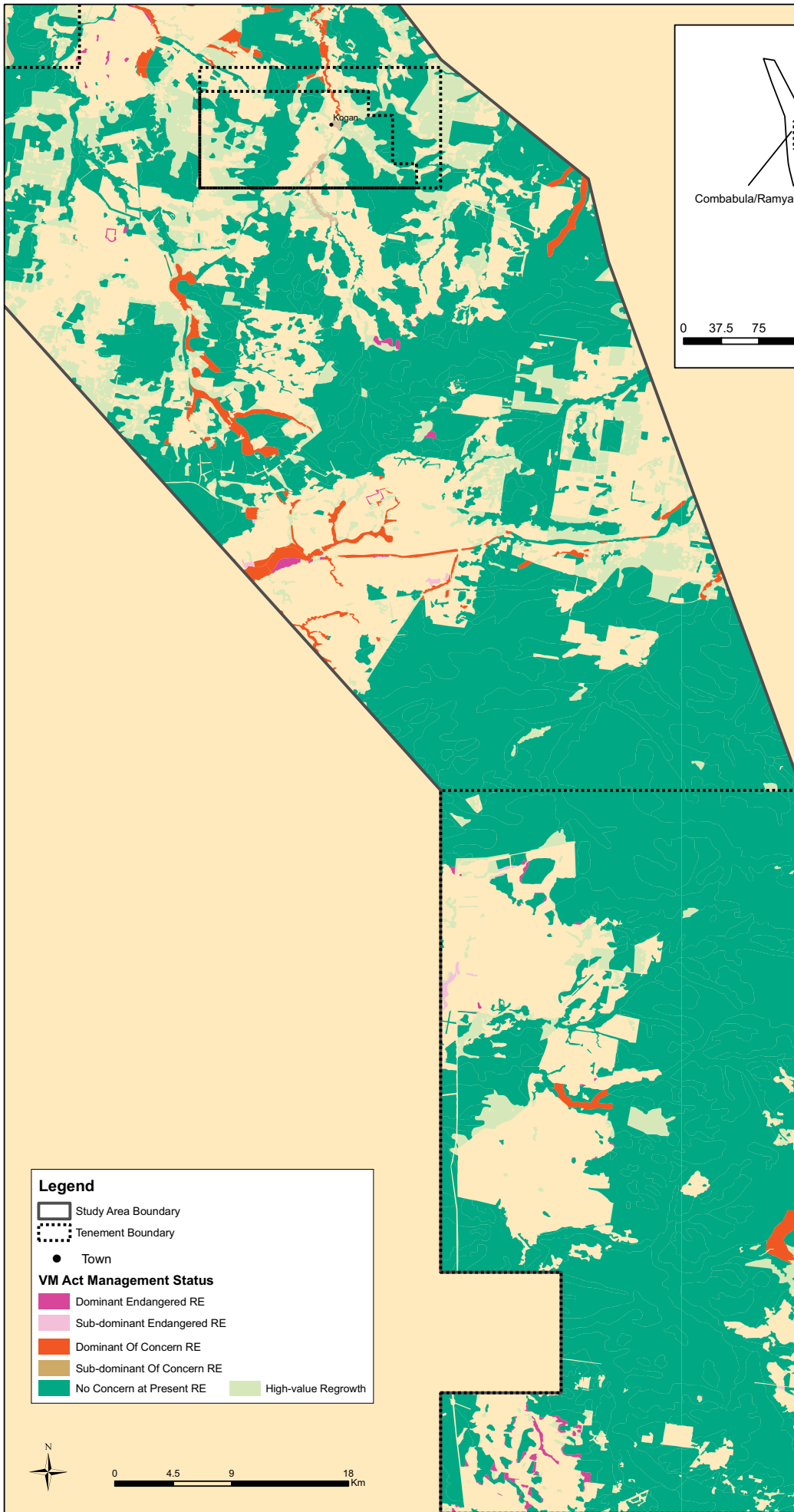


## **APPENDIX F**

### **CURRENT DERM CERTIFIED REGIONAL ECOSYSTEM (VM ACT STATUS AND BIODIVERSITY STATUS) AND EPBC ACT ENDANGERED ECOLOGICAL COMMUNITY MAPPING TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT REPORT – GAS FIELDS COMPONENT AUSTRALIA PACIFIC LNG PROJECT EIS**

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

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



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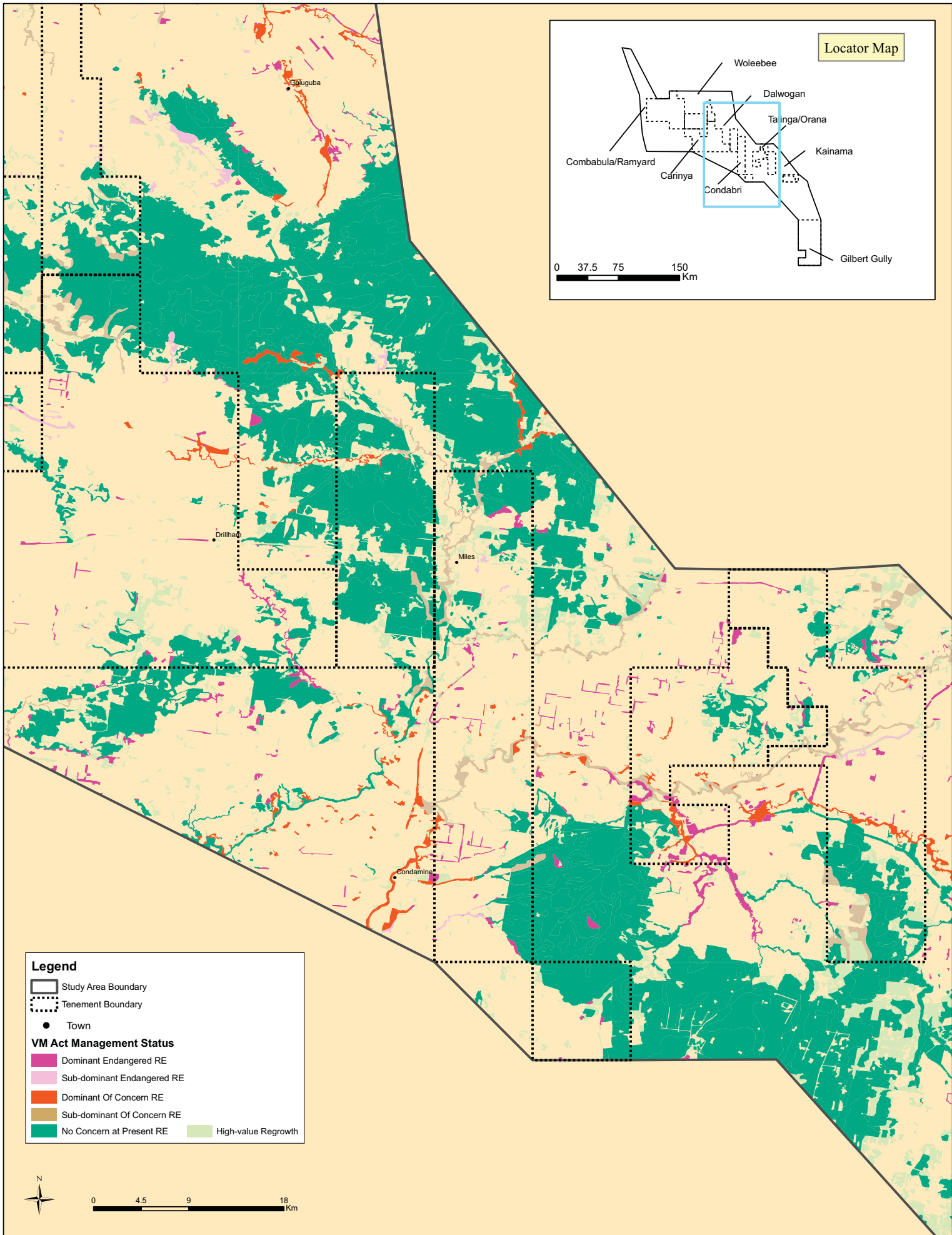
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**Figure F.1**

Current DERM Certified Vegetation Mapping (VM Act Status)

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



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## Figure F.2

Current DERM Certified Vegetation Mapping (VM Act Status)

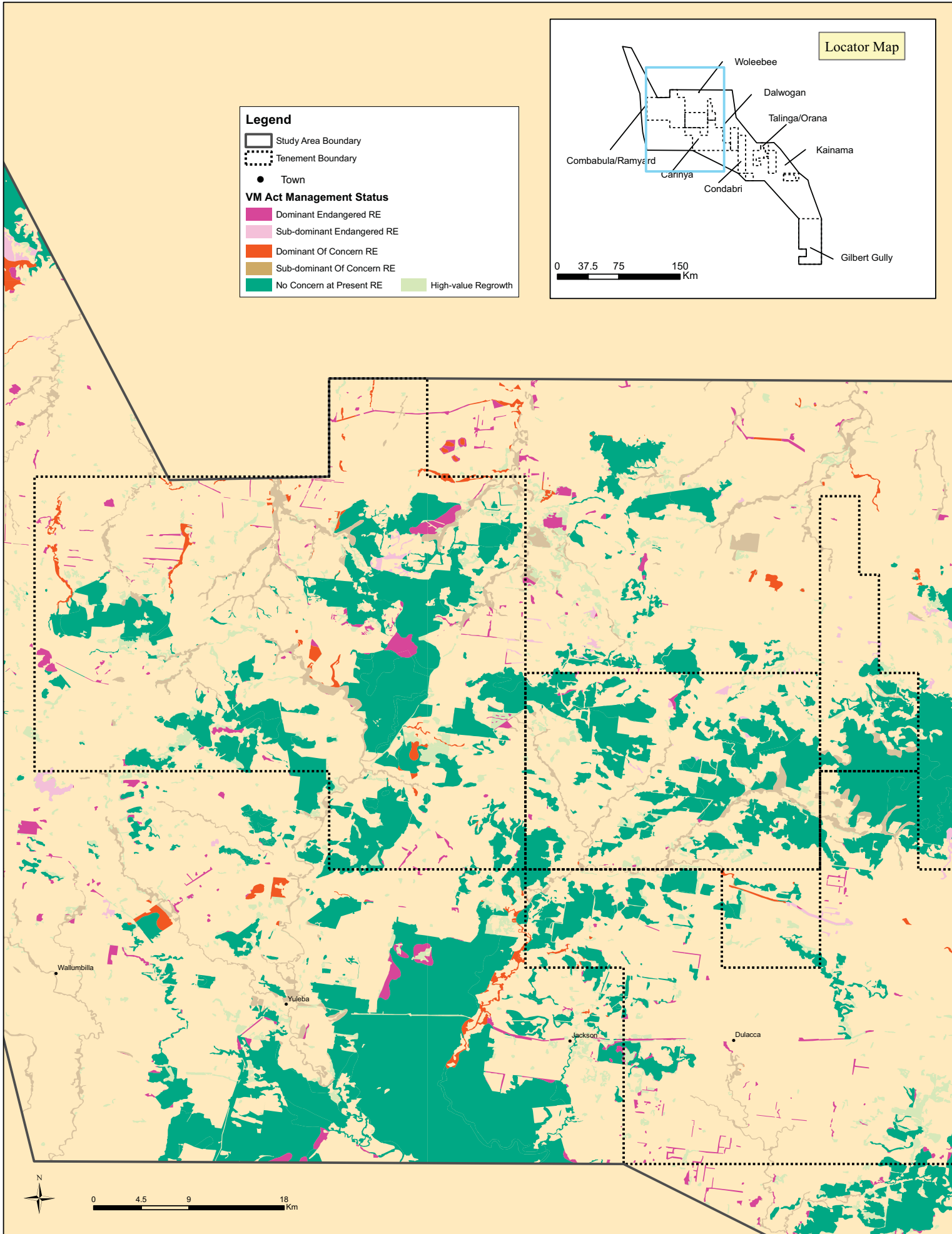
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS

Scattered throughout these open forests and woodlands are scalds dominated by bare rocky areas and low microphyll shrub layers of characteristic genera such as *Calytrix*, *Hakea*, *Kunzea*, *Micromyrtus*, *Acacia*, *Melaleuca* and (within the ground layer) *Spinifex* *Triodia* sp. (11.7.5). Scattered or fringing emergent tree species are often present, including Queensland Peppermint *Eucalyptus exserta*, Plunkett Mallee *E. curtisii*, Brown Bloodwood and Fan-Leaf Wattle *Acacia blakei*. These areas support many locally endemic species.

These large tracts of woodland and open forest are predominantly located within State Forests where they are retained for White Cypress Pine, Spotted Gum and ironbark timbers.

The entire study area is dissected by creek systems with associated Cainozoic alluvium that supports open forests of Queensland Blue Gum *Eucalyptus tereticornis*, River Red Gum *E. camaldulensis* (11.3.25), Rough-barked Apple *Angophora floribunda* and Smooth-barked Apple *A. leiocarpa* (11.3.14), while associated alluvial plains dominated by Poplar Box and Silver-leaved Ironbark (11.3.2 and 11.3.18) occur in areas less frequently inundated and often fringing 11.3.25. These vegetation communities have often been retained within cleared agricultural land to protect water courses.





**Figure F.3**

Current DERM Certified Vegetation Mapping (VM Act Status)

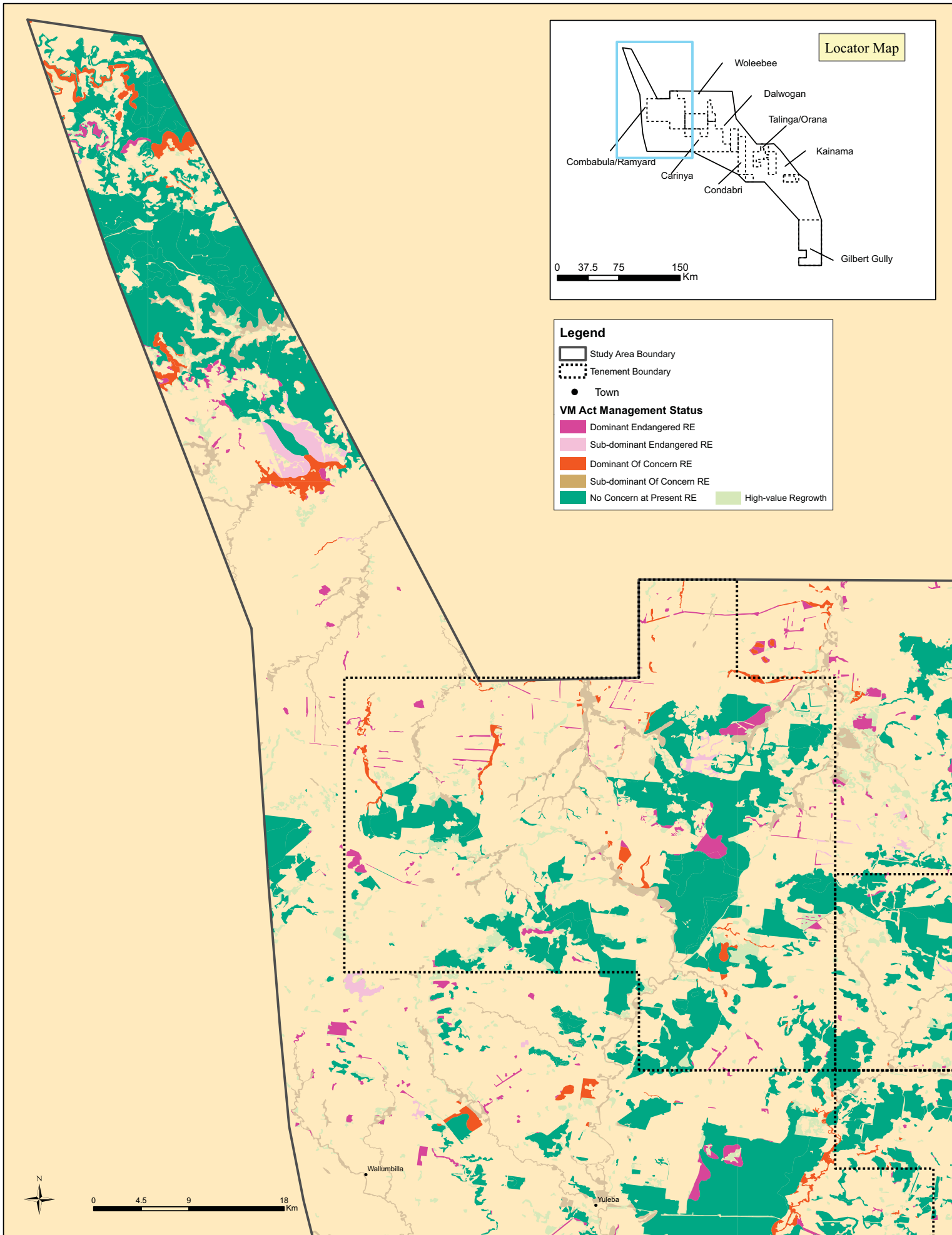
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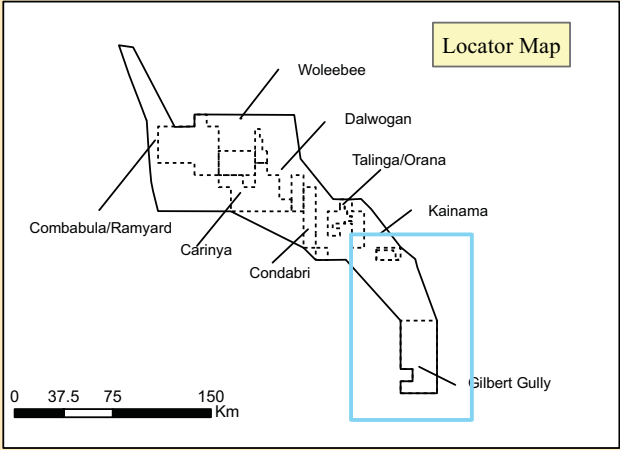
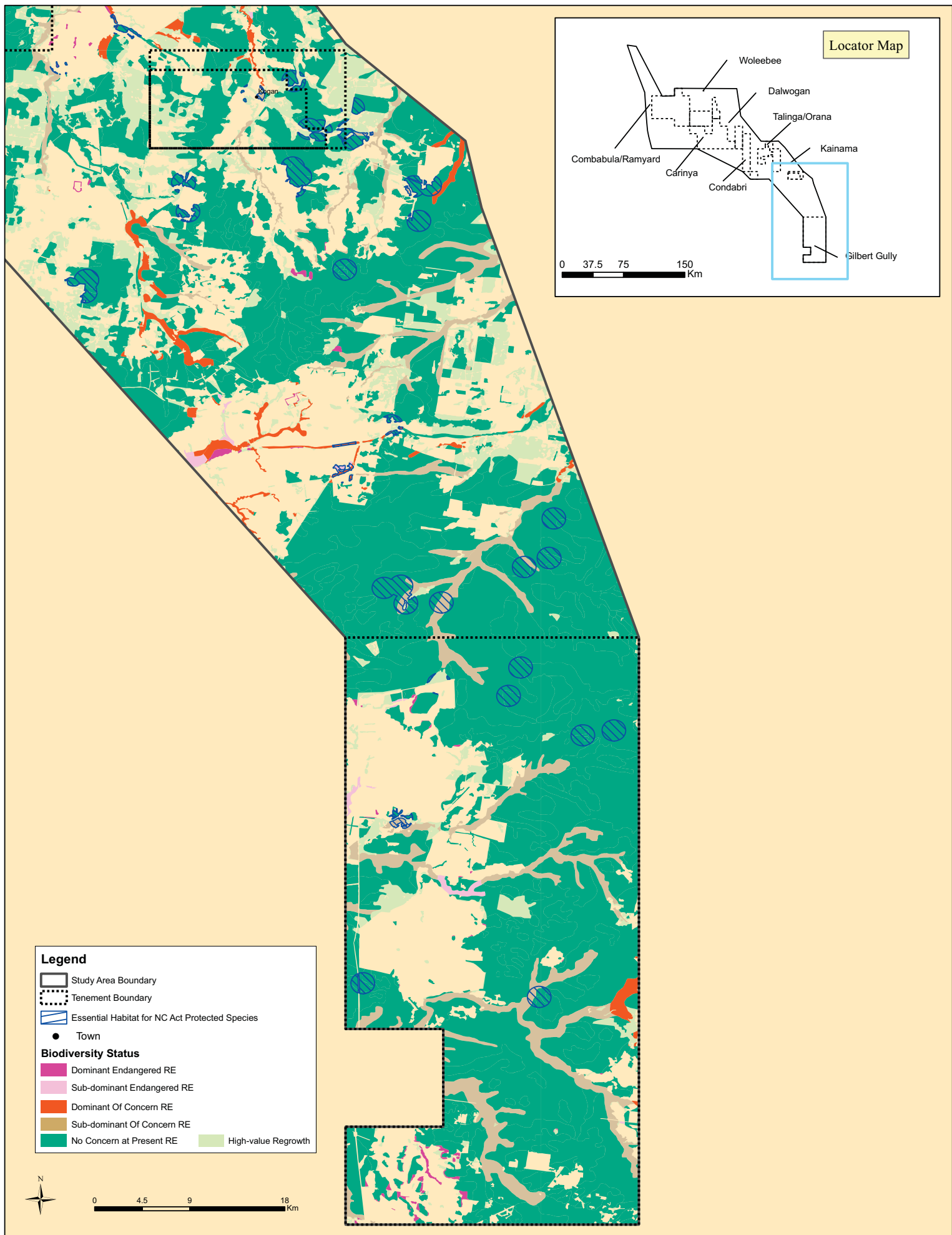
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## Figure F.4

Current DERM Certified Vegetation Mapping (VM Act Status)

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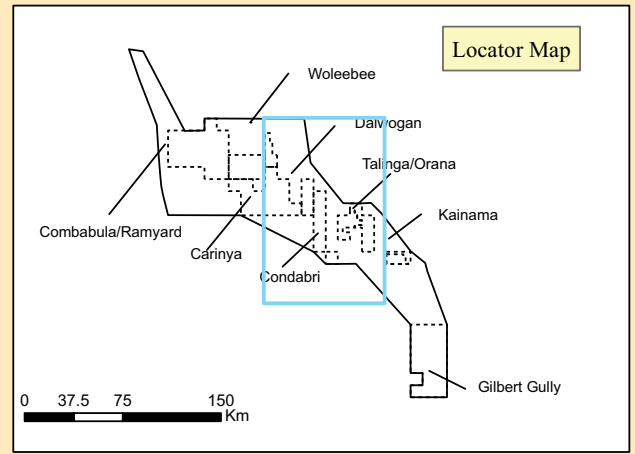
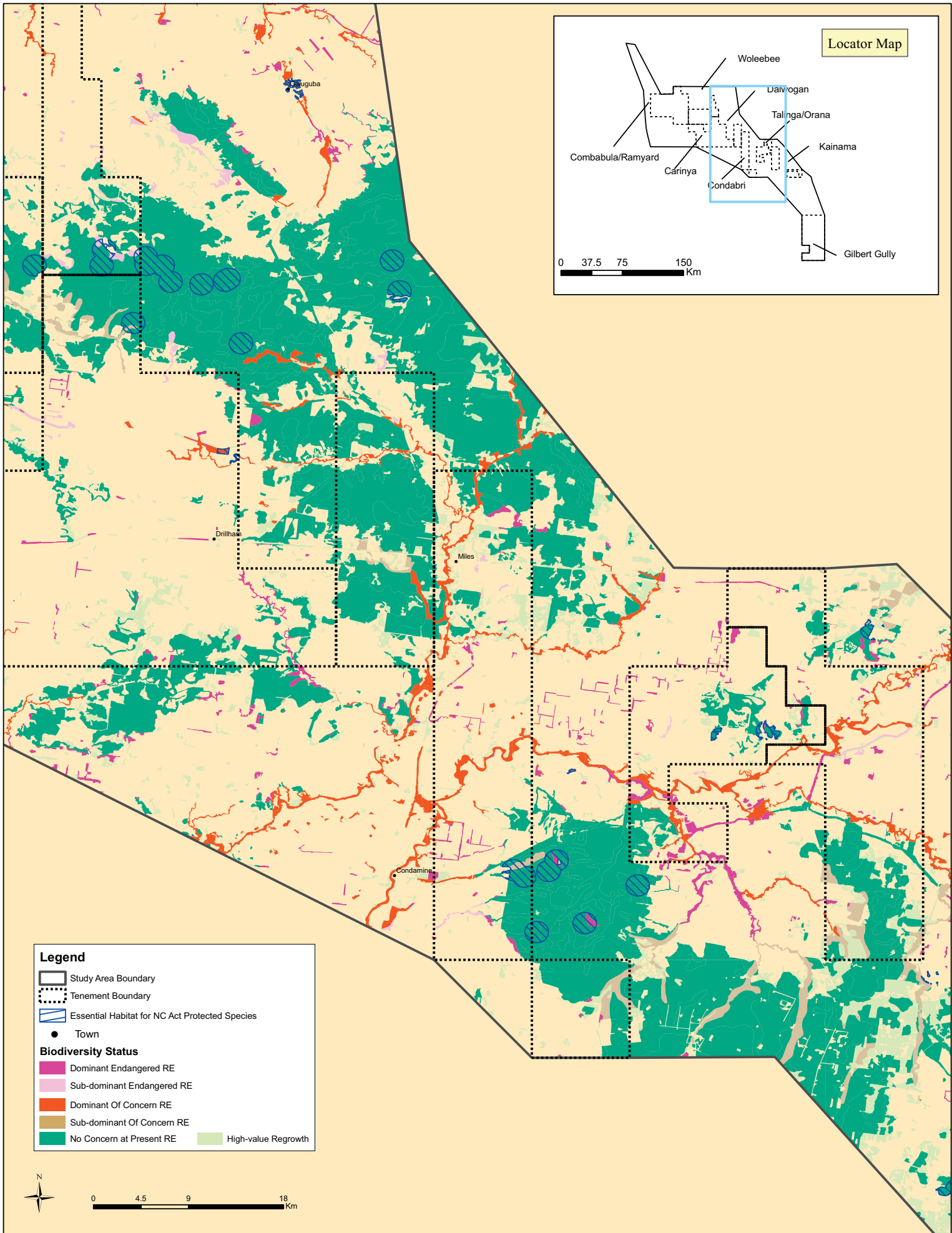
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**Figure F.5**  
**Current DERM Certified Vegetation Mapping (Biodiversity Status)**  
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**Figure F.6**

**Current DERM Certified Vegetation Mapping (Biodiversity Status)**

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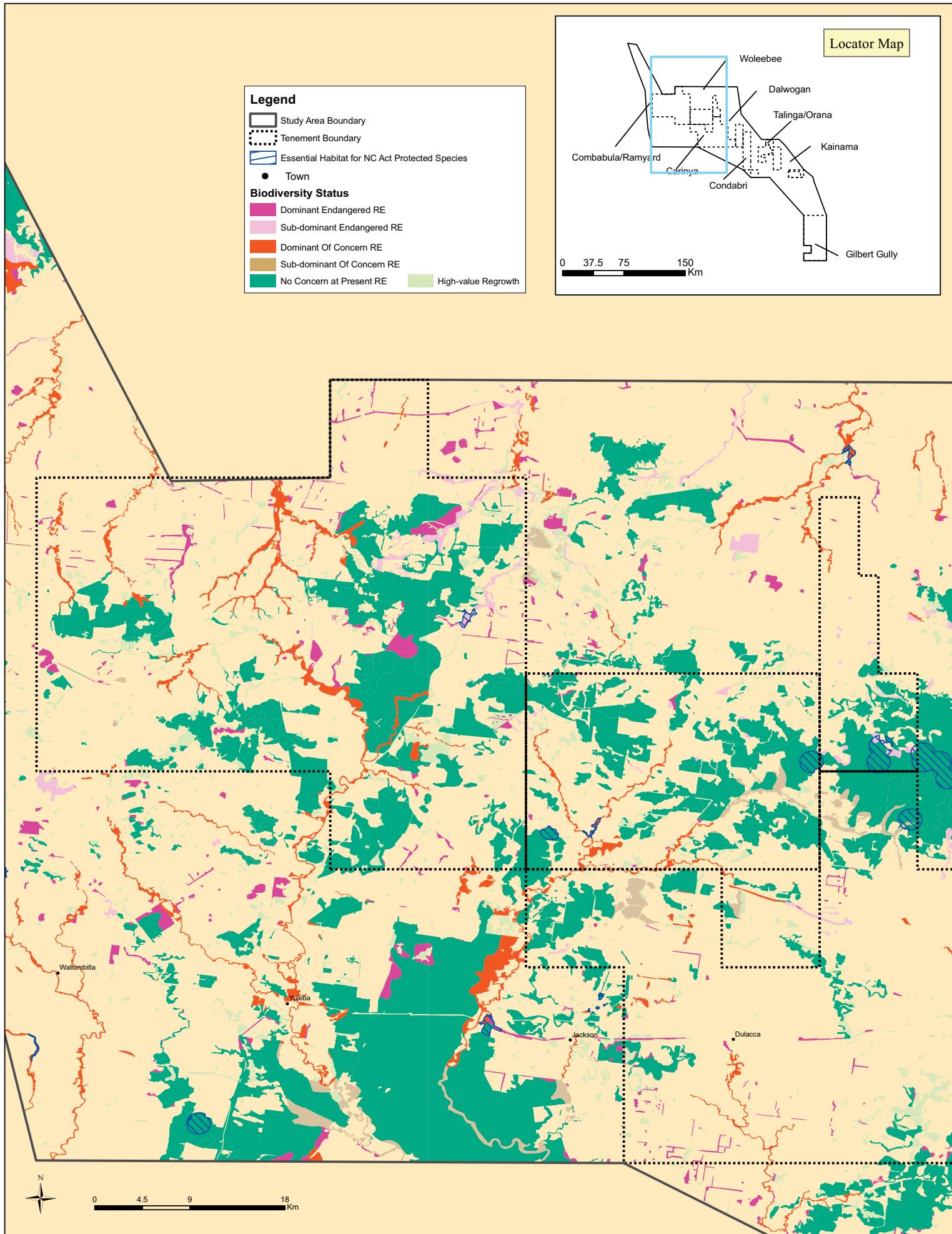


Figure F.7

Current DERM Certified Vegetation Mapping (Biodiversity Status)

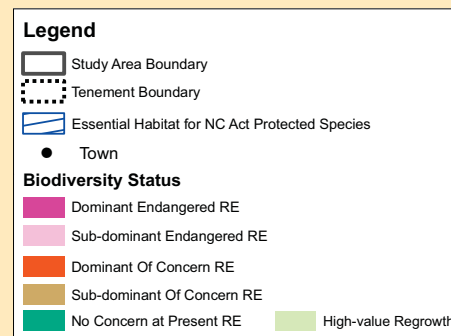
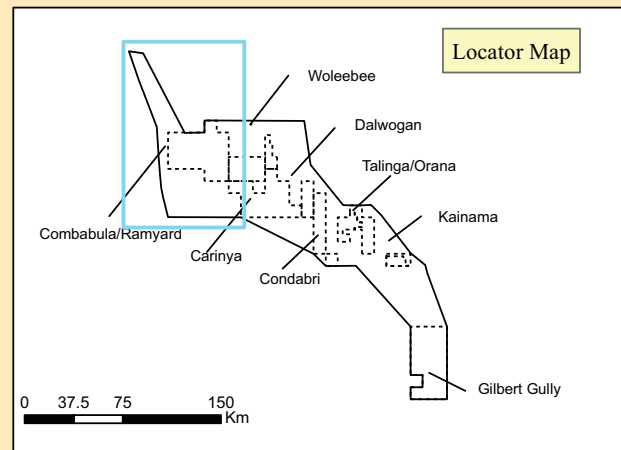
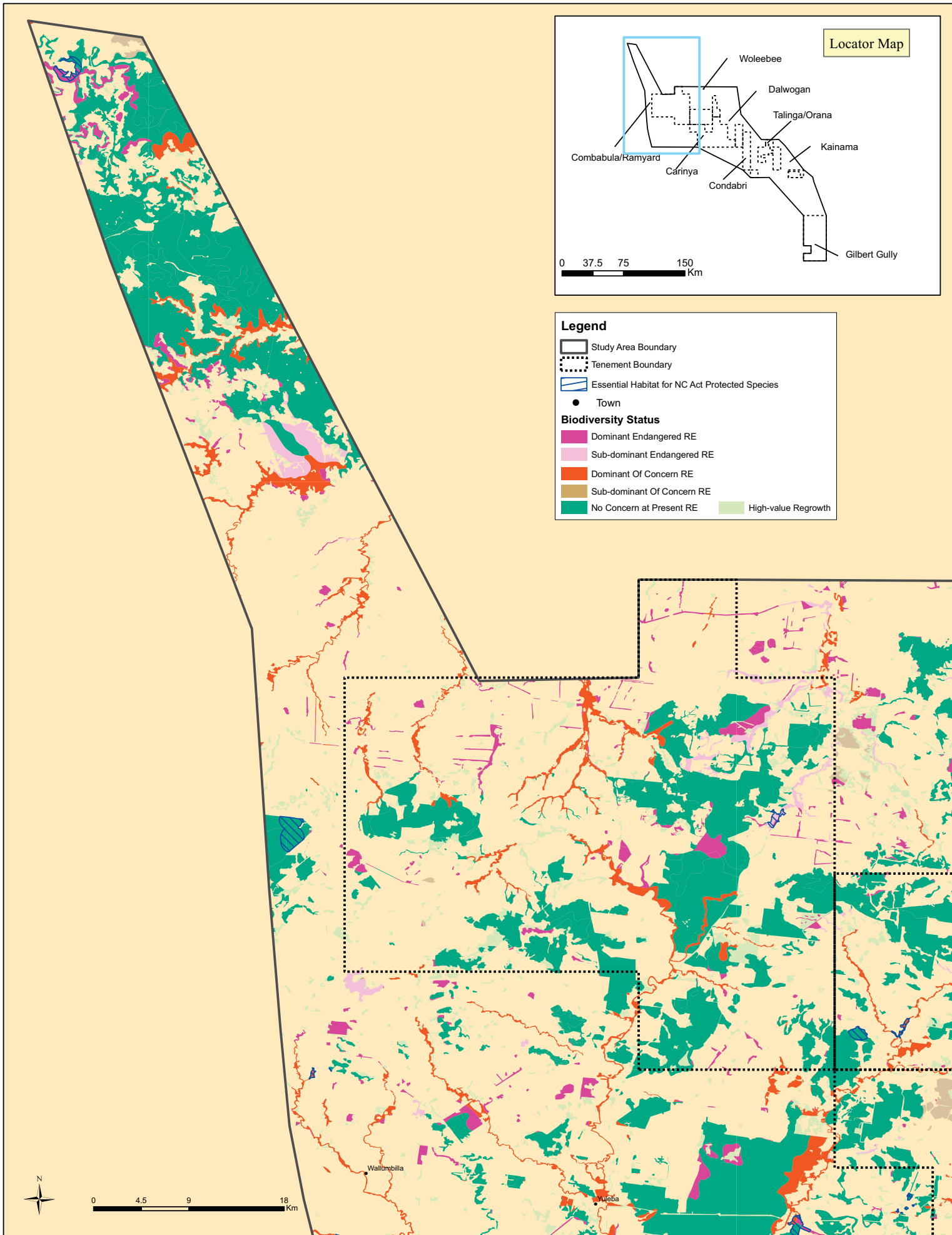
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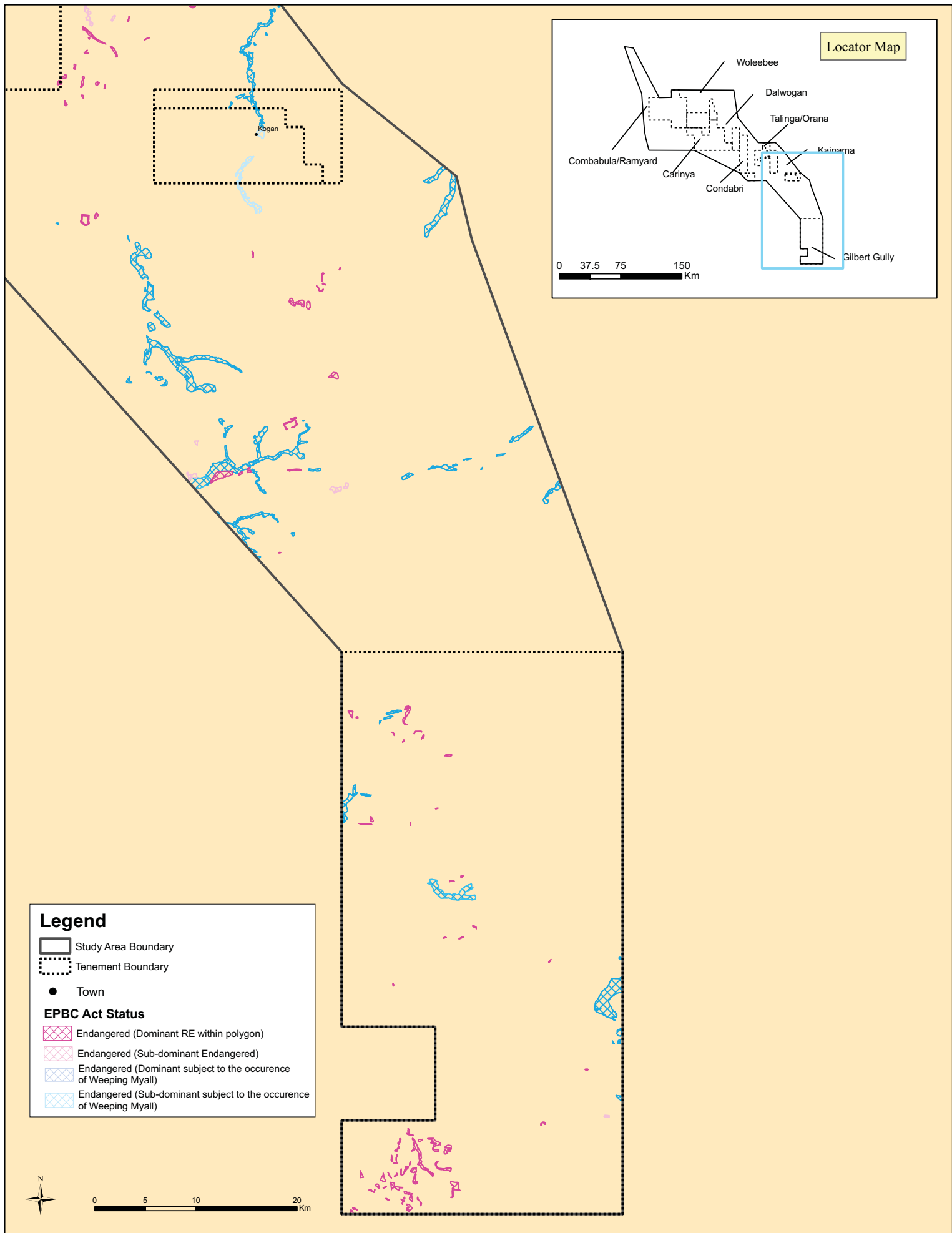
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**Figure F.8**

Current DERM Certified Vegetation Mapping (Biodiversity Status)

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**Figure F.9**

Current DERM Certified Vegetation Mapping (EPBC Act Status)

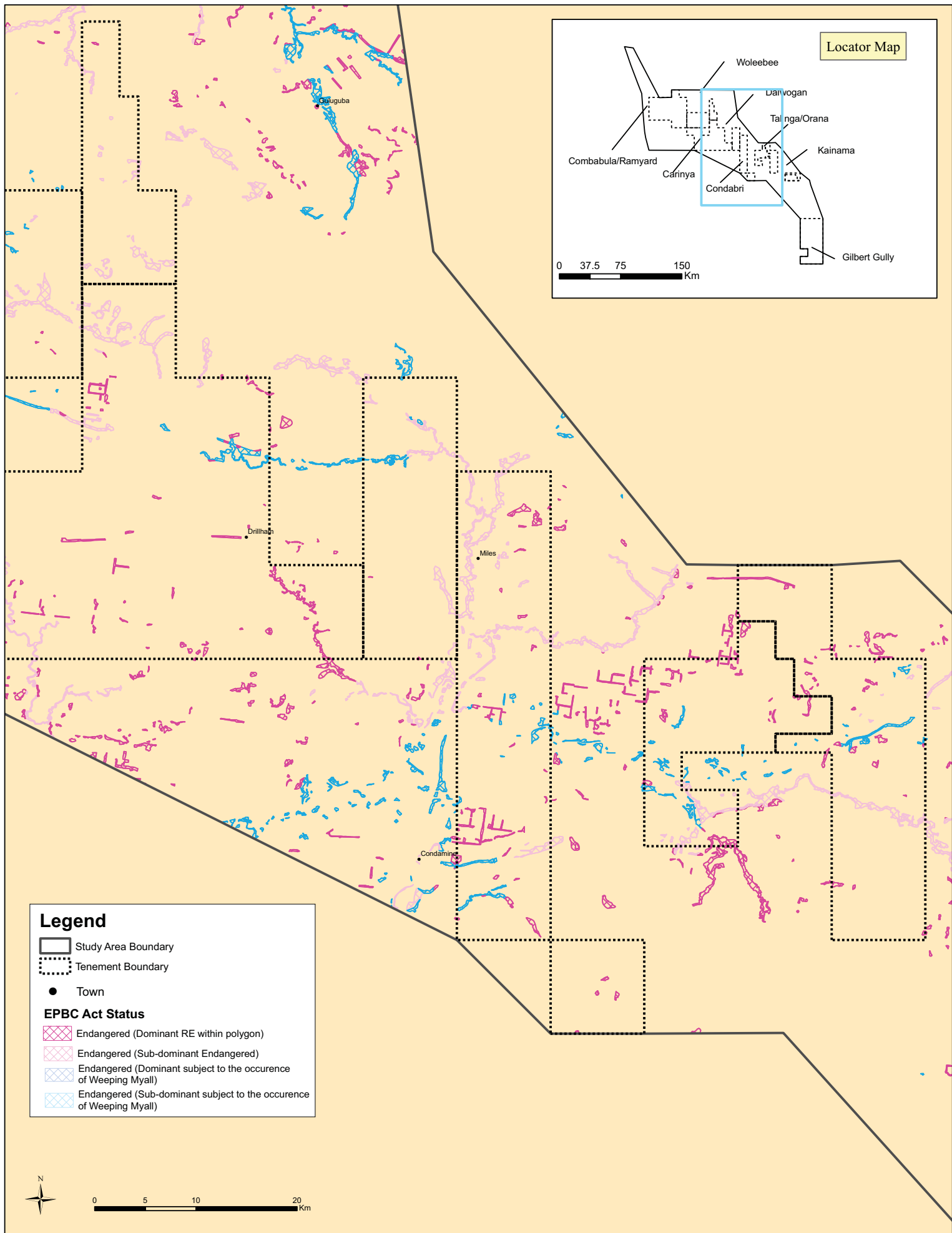
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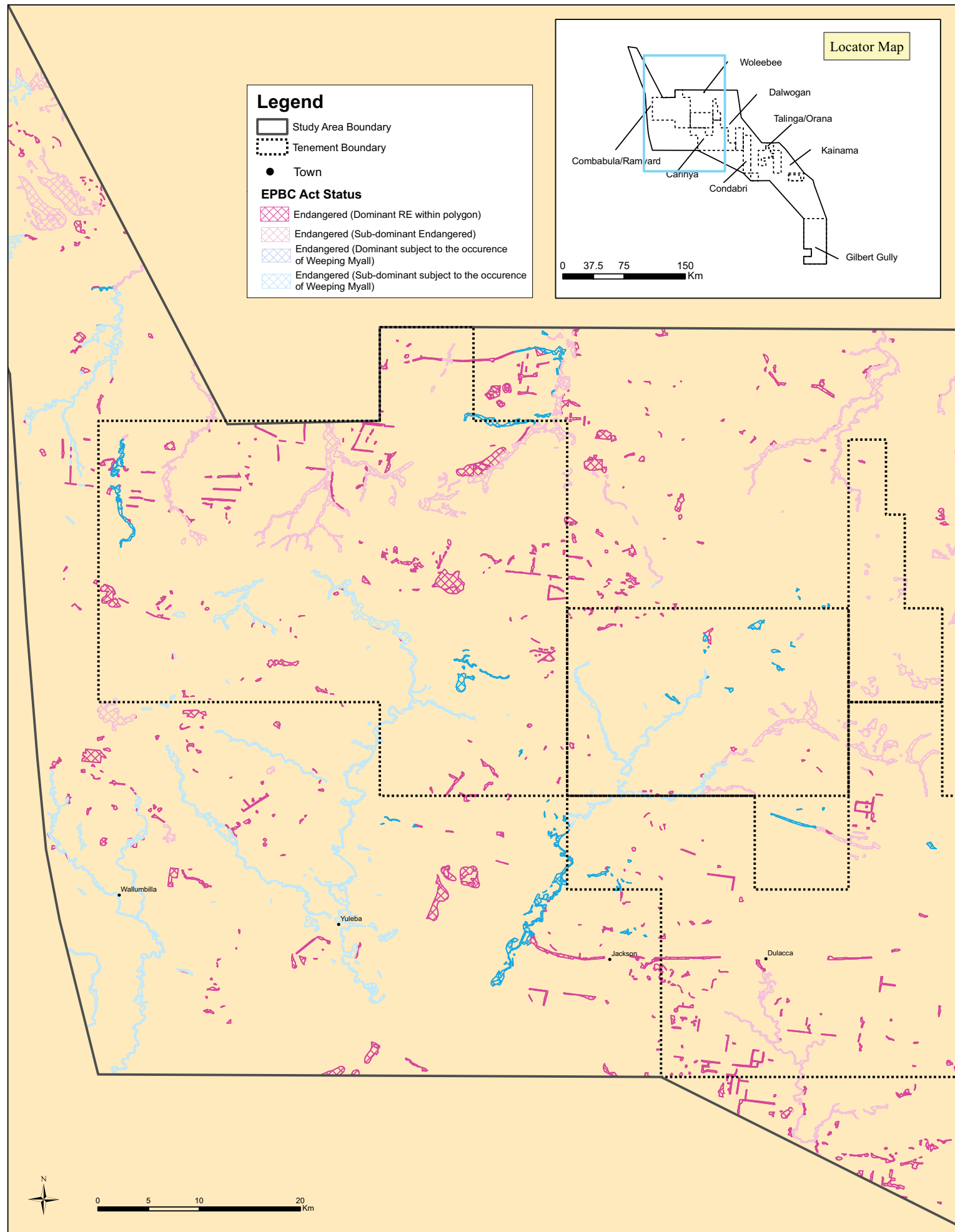
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## Figure F.10

Current DERM Certified Vegetation Mapping (EPBC Act Status)

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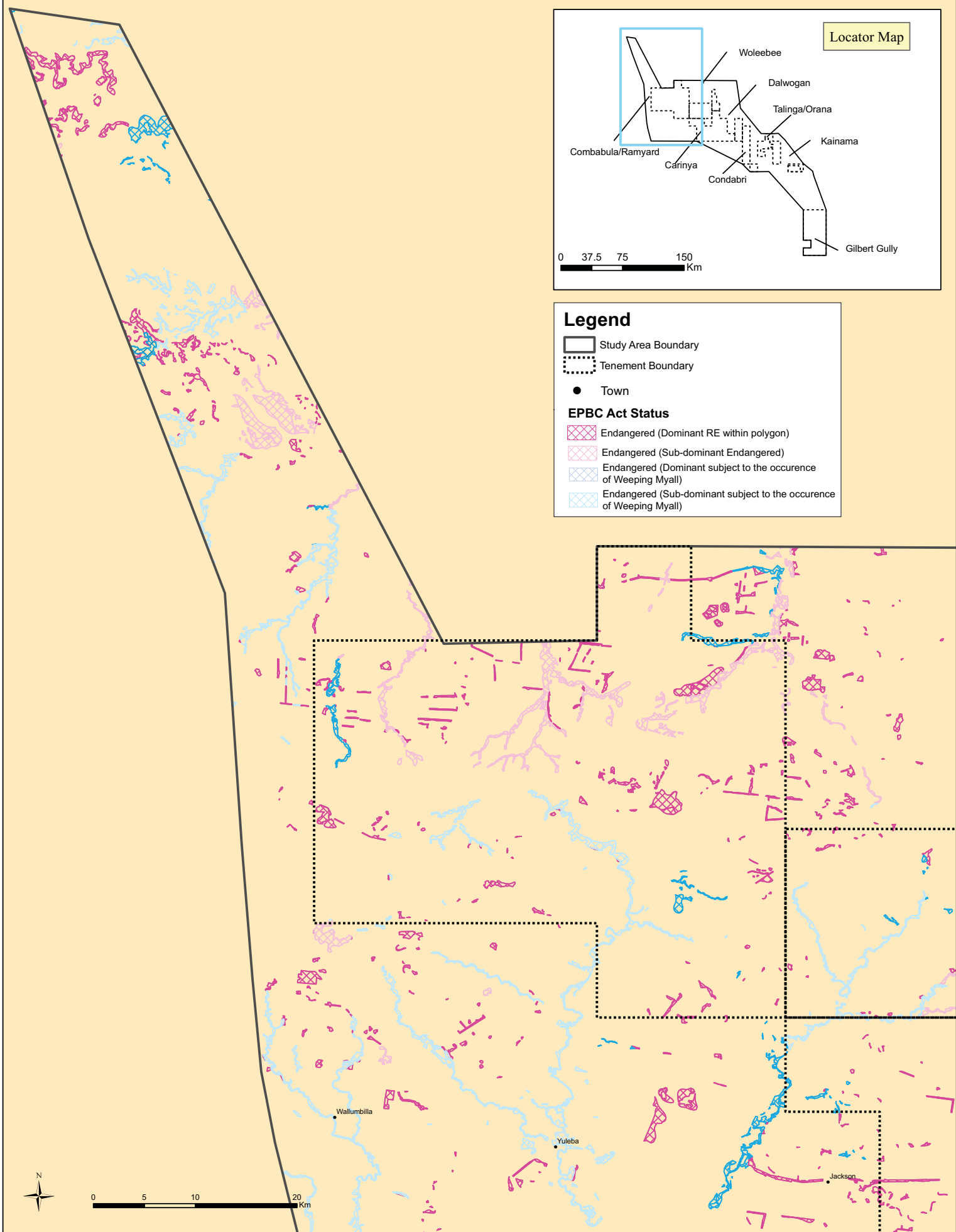


**Figure F.11**

**Current DERM Certified Vegetation Mapping (EPBC Act Status)**

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





**Figure F.12**

Current DERM Certified Vegetation Mapping (EPBC Act Status)

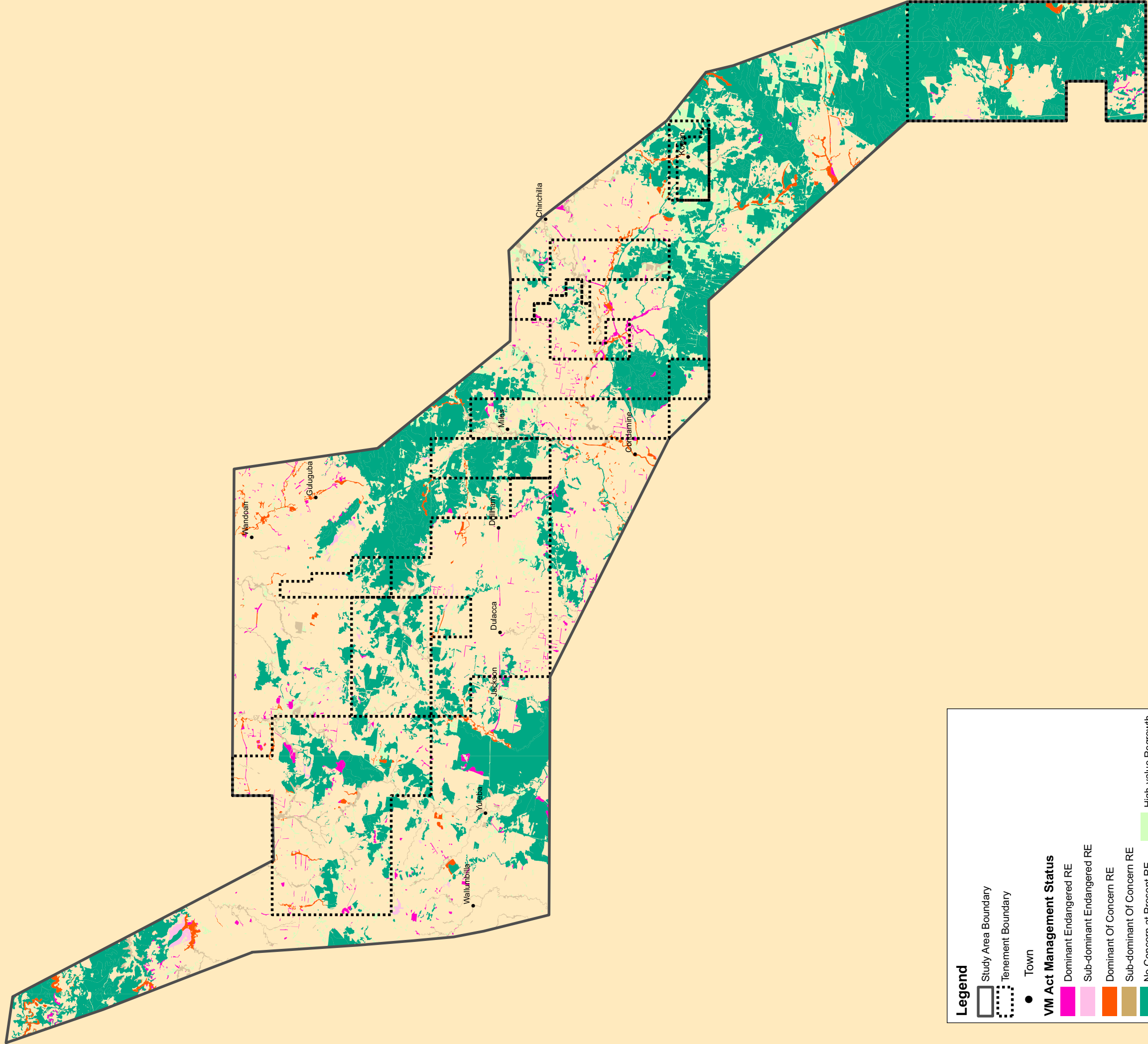
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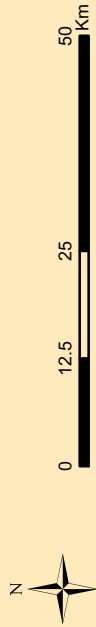
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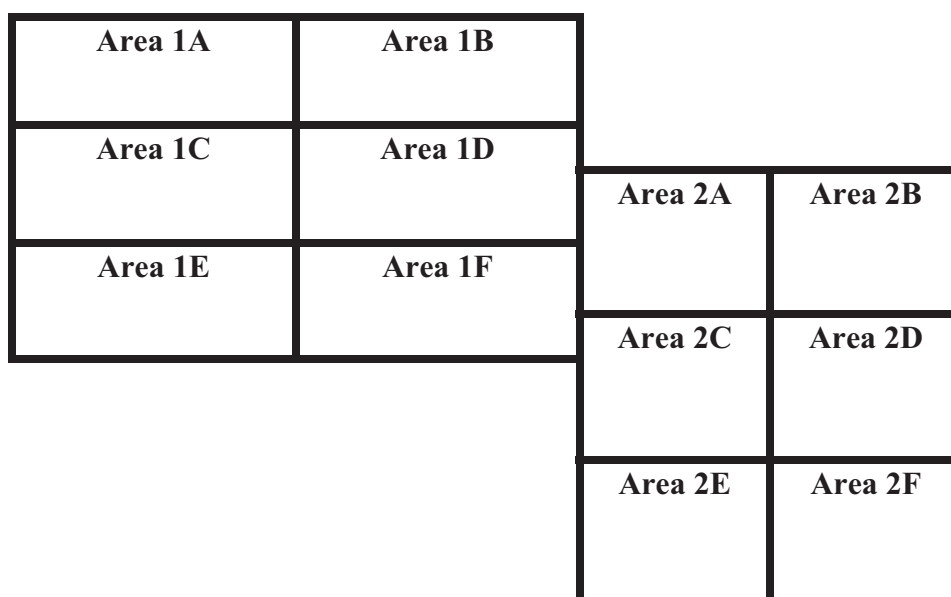
**Legend**  
Study Area Boundary  
Tenement Boundary  
Town  
**VM Act Management Status**  
Dominant Endangered RE  
Sub-dominant Endangered RE  
Dominant Of Concern RE  
Sub-dominant Of Concern RE  
No Concern at Present RE  
High-value Regrowth



**Figure 2.3**  
**Study Area Current DERM Certified**  
**Vegetation Mapping (VM Act Status)**  
**Terrestrial Ecology and Impact**  
**Assessment Report (Gas Fields Component) -**  
**Australia Pacific LNG Project EIS**

## **Appendix G: Public Database Search Results**

### **Indicative Diagram of Public Database Search Areas**



### **Public Database Search Area Details**

Wildlife Online Searches: Smaller areas 1A, 1B, etc all searched separately (due to online search restrictions) and subsequently combined.

WildNet Locality Data: GIS file of actual Study Area provided as the basis for the search area.

QLD Museum Database and Birds Australia Atlas Database Searches: Larger Areas 1 and 2 searched separately to avoid large areas outside of the Study Area (i.e. below Area 1 and above Area 2) and subsequently combined.

### **Coordinates (top left to bottom right)**

Area	Latitude		Longitude	
	Top	Bottom	Left	Right
1A	25.5686	26.0759	148.8084	149.4623
1B			149.4623	150.1162
1C	26.0759	26.5832	148.8084	149.4623
1D			149.4623	150.1162
1E	26.5832	27.0905	148.8084	149.4623
1F			149.4623	150.1162
2A	26.5378	27.0282	150.1162	150.6164
2B			150.6164	151.1165
2C	27.0282	27.5186	150.1162	150.6164
2D			150.6164	151.1165
2E	27.5186	28.0090	150.1162	150.6164
2F			150.6164	151.1165





plants	higher dicots	Myrtaceae	Eucalyptus virens	shiny-leaved ironbark	V	V	3	2	2C
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		1	1	1D
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		1	1	1E
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		2	2	2A
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		1	1	2B
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		1	1	2E
plants	higher dicots	Haloragaceae	Gonocarpus urceolatus		V		2	2	2F
plants	higher dicots	Malvaceae	Gossypium sturtianum		R		1	1	1A
plants	higher dicots	Malvaceae	Gossypium sturtianum		R		1	1	1C
plants	higher dicots	Proteaceae	Grevillea singuliflora		R		1	1	2B
plants	higher dicots	Myrtaceae	Melaleuca irbyana		R		3	3	1A
plants	higher dicots	Scrophulariaceae	Microcarpaea agonis		E	E	1	1	2F
plants	higher dicots	Myrtaceae	Micromyrtus carinata	Gurulmundi heath-myrtle	E		24	21	1D
plants	higher dicots	Myrtaceae	Micromyrtus carinata	Gurulmundi heath-myrtle	E		1	1	2B
plants	higher dicots	Oleaceae	Notelaea pungens		R		1	1	2B
plants	higher dicots	Rutaceae	Philotheca sporadica		V	V	1	1	2B
plants	higher dicots	Rutaceae	Philotheca sporadica		V	V	4	4	2C
plants	higher dicots	Rutaceae	Philotheca sporadica		V	V	26	26	2D
plants	higher dicots	Rutaceae	Philotheca sporadica		V	V	2	2	2F
plants	higher dicots	Lamiaceae	Prostanthera sp. (Dunmore D.M.Gordon 8A)		V	V	1	1	2E
plants	higher dicots	Lamiaceae	Prostanthera sp. (Dunmore D.M.Gordon 8A)		V	V	2	2	2F
plants	higher dicots	Asteraceae	Rutidosia crispata		R		1	1	1B
plants	higher dicots	Asteraceae	Rutidosia lanata		E		1	1	1D
plants	higher dicots	Asteraceae	Rutidosia lanata		E		2	2	1F
plants	higher dicots	Asteraceae	Rutidosia lanata		E		1	1	2B
plants	higher dicots	Asteraceae	Rutidosia lanata		E		2	2	2C
plants	higher dicots	Solanaceae	Solanum stenopterum		V		1	1	1F
plants	higher dicots	Santalaceae	Thesium australe	toadflax	V	V	1	1	2D
plants	monocots	Aponogetonaceae	Aponogeton queenslandicus		R		1	1	1F
plants	monocots	Aponogetonaceae	Aponogeton queenslandicus		R		1	1	2A
plants	monocots	Aponogetonaceae	Aponogeton queenslandicus		R		1	1	2C
plants	monocots	Poaceae	Digitaria porrecta		R	E	1	1	2D
plants	monocots	Orchidaceae	Diuris tricolor		C	V	1	1	1D
plants	monocots	Cyperaceae	Eleocharis blakeana		R		2	2	2A
plants	monocots	Cyperaceae	Eleocharis blakeana		R		1	1	2C
plants	monocots	Cyperaceae	Eleocharis blakeana		R		3	3	2D
plants	monocots	Eriocaulaceae	Eriocaulon carsonii subsp. orientale		E		1	1	1A
plants	monocots	Cyperaceae	Fimbristylis vagans		R		4	4	2B
plants	monocots	Cyperaceae	Fimbristylis vagans		R		1	1	2C
plants	monocots	Cyperaceae	Fimbristylis vagans		R		1	1	2D
plants	monocots	Poaceae	Homopholis belsonii		E	V	1	1	1D
plants	monocots	Poaceae	Homopholis belsonii		E	V	1	1	1F
plants	monocots	Orchidaceae	Pterostylis cobarensis		C	V	1	1	2A
plants	monocots	Poaceae	Sporobolus parlimpatens		R		1	1	1A
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		13	0	1B
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		13	0	2B
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		3	0	2C
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		4	0	2D
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		1	0	2E
animals	insects	Lycanidae	Jalmenus eubulus	pale imperial hairstreak	V		1	0	2F
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		2	2	1A
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		2	0	1C
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		12	0	1E
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		5	0	1F
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		2	0	2A
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		1	0	2B
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		11	0	2C
animals	amphibians	Hylidae	Cydorana verrucosa	rough collared frog	R		28	7	2D

animals	amphibians	hylidae	Cydorana verrucosa	rough collared frog	R		22	2	2E
animals	amphibians	hylidae	Cydorana verrucosa	rough collared frog	R		1	0	2F
animals	birds	accipitridae	Accipiter novaehollandiae	grey goshawk	R		2	0	2A
animals	birds	accipitridae	Accipiter novaehollandiae	grey goshawk	R		2	0	2B
animals	birds	meliphagidae	Anthochaera phrygia	regent honeyeater	E	E	1	1	2B
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		1	0	1A
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		1	0	1F
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		3	0	2A
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		2	0	2B
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		10	0	2D
animals	birds	cacatuidae	Calyptorhynchus lathami	glossy black-cockatoo	V		2	0	2E
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	V		3	0	2F
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		3	0	1A
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		1	0	1B
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		2	0	1E
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		1	0	1F
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		4	0	2A
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		5	0	2B
animals	birds	ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	R		14	0	2D
animals	birds	accipitridae	Erythrorhynchus radiatus	red goshawk	E	V	1	0	2D
animals	birds	falconidae	Falco hypoleucos	grey falcon	R		2	0	2B
animals	birds	columbidae	Geophas scripta scripta	squatter pigeon (southern subspecies)	V	V	1	0	1F
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		1	0	1C
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		4	0	1E
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		6	0	1F
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		8	0	2A
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		26	0	2B
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		3	0	2C
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		3	0	2D
animals	birds	meliphagidae	Grantiella picta	painted honeyeater	R		4	0	2E
animals	birds	psittacidae	Lathamus discolor	swift parrot	E	E	2	0	2A
animals	birds	cacatuidae	Lophochroa leadbeateri	Major Mitchell's cockatoo	V		1	0	2B
animals	birds	cacatuidae	Lophochroa leadbeateri	Major Mitchell's cockatoo	V		1	0	2D
animals	birds	accipitridae	Lophocitnia isura	square-tailed kite	R		1	0	1B
animals	birds	accipitridae	Lophocitnia isura	square-tailed kite	R		2	0	1C
animals	birds	accipitridae	Lophocitnia isura	square-tailed kite	R		5	0	2A
animals	birds	accipitridae	Lophocitnia isura	square-tailed kite	R		9	0	2D
animals	birds	accipitridae	Lophocitnia isura	square-tailed kite	R		1	0	2E
animals	birds	meliphagidae	Melithreptus gularis	black-chinned honeyeater	R		3	0	1B
animals	birds	meliphagidae	Melithreptus gularis	black-chinned honeyeater	R		3	0	2A
animals	birds	meliphagidae	Melithreptus gularis	black-chinned honeyeater	R		1	0	2B
animals	birds	meliphagidae	Melithreptus gularis	black-chinned honeyeater	R		1	0	2D
animals	birds	psittacidae	Neophema pulchella	turquoise parrot	R		1	0	2A
animals	birds	psittacidae	Neophema pulchella	turquoise parrot	R		9	0	2D
animals	birds	psittacidae	Neophema pulchella	turquoise parrot	R		2	0	2F
animals	birds	anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		6	0	1A
animals	birds	anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	1F
animals	birds	anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	2B
animals	birds	anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		8	0	2D
animals	birds	anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	2E
animals	birds	pedionomidae	Pedionomus torquatus	plains-wanderer	V	V	4	0	2B
animals	birds	psittacidae	Psephotus pulcherrimus	paradise parrot	PE	EX	1	0	2A
animals	birds	rostratulidae	Rostratula australis	Australian painted snipe	V	V	8	0	2D
animals	birds	anatidae	Stictonetta naevosa	freckled duck	R		2	0	1B
animals	birds	anatidae	Stictonetta naevosa	freckled duck	R		6	0	2D
animals	birds	turnicidae	Turnix melanogaster	black-breasted button-quail	V	V	1	0	1B
animals	reptiles	elapidae	Acanthophis antarcticus	common death adder	R		2	1	1C
animals	reptiles	elapidae	Acanthophis antarcticus	common death adder	R		1	0	1E



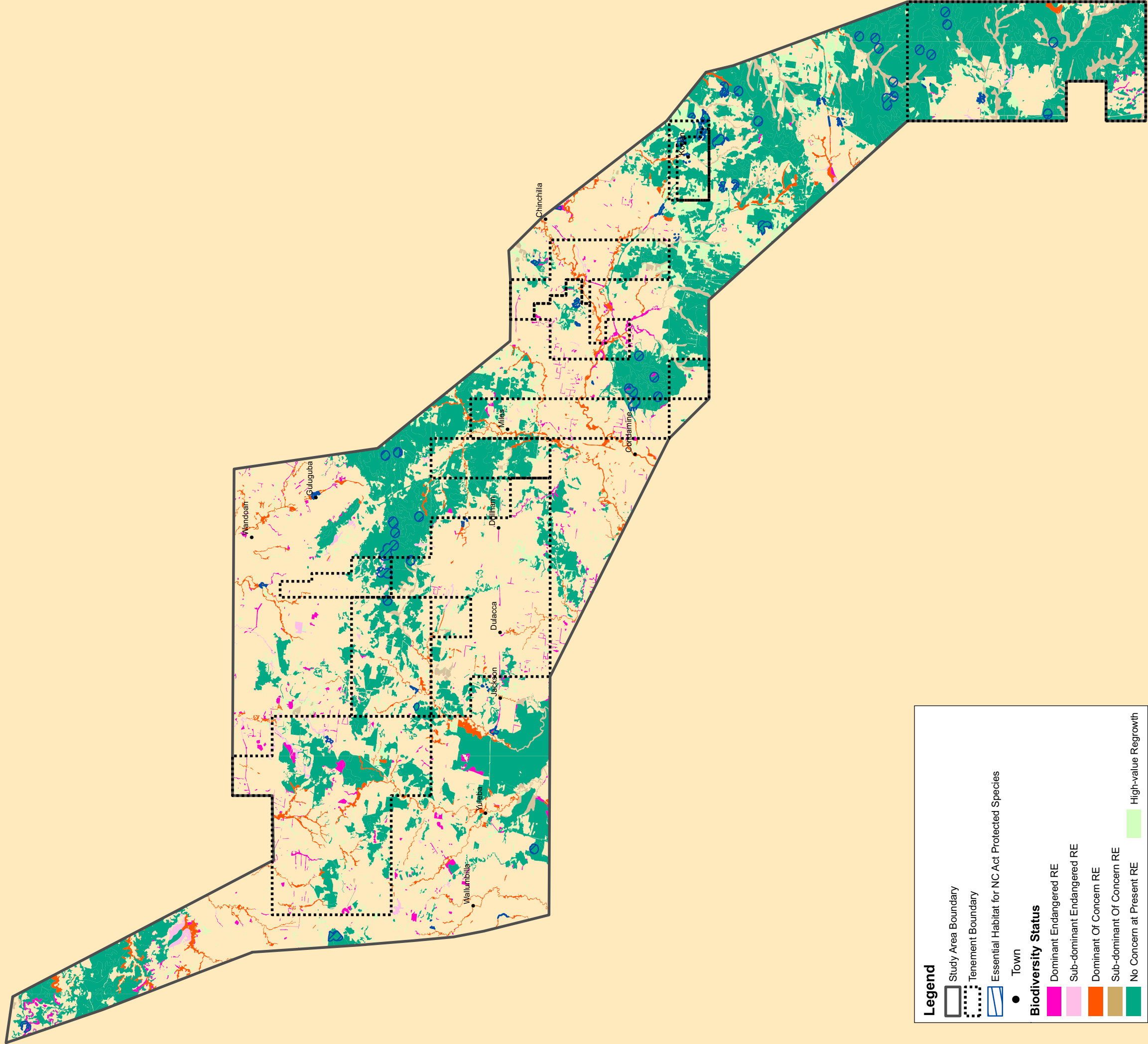


animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		6	0	1E
animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		31	0	2A
animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		16	0	2B
animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		6	0	2C
animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		87	0	2D
animals	birds	Ardeidae	Ardea modesta	eastern great egret	C		3	0	2E
animals	birds	Scolopacidae	Calidris acuminata	sharp-tailed sandpiper	C		1	0	1C
animals	birds	Scolopacidae	Calidris acuminata	sharp-tailed sandpiper	C		28	0	2D
animals	birds	Scolopacidae	Calidris acuminata	sharp-tailed sandpiper	C		1	0	2E
animals	birds	Scolopacidae	Calidris ferruginea	curlew sandpiper	C		3	0	2D
animals	birds	Scolopacidae	Calidris ruficollis	red-necked stint	C		3	0	2D
animals	birds	Fregatidae	Fregata ariel	lesser frigatebird	C		1	0	2A
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		2	0	1A
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		1	0	1F
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		3	0	2A
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		1	0	2B
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		30	0	2D
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	C		1	0	2E
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		1	0	1A
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		2	0	1E
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		1	0	1F
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		7	0	2A
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		2	0	2B
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		4	0	2C
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	C		52	0	2D
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		1	0	1A
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		1	0	1B
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		2	0	1D
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		13	0	1F
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		6	0	2A
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		2	0	2B
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		23	0	2D
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail	C		5	0	2F
animals	birds	Laridae	Hydroprogne caspia	Caspian tern	C		1	0	2A
animals	birds	Laridae	Hydroprogne caspia	Caspian tern	C		6	0	2D
animals	birds	Scolopacidae	Limosa lapponica	bar-tailed godwit	C		2	0	2D
animals	birds	Scolopacidae	Limosa limosa	black-tailed godwit	C		1	0	2D
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		5	0	1A
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		17	0	1B
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		3	0	1C
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		8	0	1D
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		2	0	1E
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		17	0	1F
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		25	0	2A
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		15	0	2B
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		8	0	2C
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		65	0	2D
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		9	0	2E
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater	C		8	0	2F
animals	birds	Monarchidae	Monarcha melanops	black-faced monarch	C		1	0	2B
animals	birds	Monarchidae	Myiagra cyanoleuca	satin flycatcher	C		1	0	1B
animals	birds	Monarchidae	Myiagra cyanoleuca	satin flycatcher	C		4	0	2D
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		6	0	1A
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	1F
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	2B
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		8	0	2D
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose	R		1	0	2E
animals	birds	Scolopacidae	Numenius phaeopus	whimbrel	C		2	0	2D









**Legend**

Study Area Boundary

Tenement Boundary

Essential Habitat for NC Act Protected Species

Town

**Biodiversity Status**

Dominant Endangered RE

Sub-dominant Endangered RE

Dominant Of Concern RE

Sub-dominant Of Concern RE

No Concern at Present RE

High-value Regrowth

**Figure 2.4**  
**Studyc Area Current DERM Certified**  
**Vegetation Mapping (Biodiversity Status)**  
**Terrestrial Ecology and Impact**  
**Assessment Report (Gas Fields Component) -**  
**Australia Pacific LNG Project EIS**

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animals	amphibians	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	13	0	2C
animals	amphibians	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	17	0	2D
animals	amphibians	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	14	1	2E
animals	amphibians	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	1	0	2F
animals	reptiles	Agamidae	Amphibolurus burnsi		C	10	0	1E
animals	reptiles	Agamidae	Amphibolurus burnsi		C	1	0	1F
animals	reptiles	Agamidae	Amphibolurus burnsi		C	3	1	2A
animals	reptiles	Agamidae	Amphibolurus burnsi		C	1	0	2C
animals	reptiles	Agamidae	Amphibolurus burnsi		C	3	0	2D
animals	reptiles	Agamidae	Amphibolurus burnsi		C	1	0	2E
animals	reptiles	Agamidae	Amphibolurus burnsi		C	1	0	1C
animals	reptiles	Scincidae	Ctenotus ingrami		C	3	0	1D
animals	reptiles	Scincidae	Ctenotus ingrami		C	4	1	1E
animals	reptiles	Scincidae	Ctenotus ingrami		C	17	1	1F
animals	reptiles	Scincidae	Cydodromorphus gerrardii	pink-tongued lizard	C	1	1	1B
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	4	1	1C
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	1	0	1E
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	1	0	1F
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	2	2	2A
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	2	0	2D
animals	reptiles	Chelidae	Emydura macquarii krefftii	Krefft's river turtle	C	3	0	1B
animals	reptiles	Chelidae	Emydura macquarii macquarii	Murray turtle	C	1	0	2B
animals	reptiles	Chelidae	Emydura macquarii macquarii	Murray turtle	C	2	0	2D
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	3	2	1A
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	1	0	1B
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	5	2	1D
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	1	0	1E
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	2	0	1F
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	2	0	2A
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	1	1	2B
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	1	0	2C
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	3	1	2D
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	1	0	2E
animals	reptiles	Chelidae	Macrochelodina expansa	broad-shelled river turtle	C	1	0	1B
animals	reptiles	Chelidae	Macrochelodina expansa	broad-shelled river turtle	C	2	0	1E
animals	reptiles	Chelidae	Macrochelodina expansa	broad-shelled river turtle	C	1	0	2D
animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	2	0	1A
animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	1	0	1B
animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	7	0	1F
animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	1	0	2A
animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	1	0	2D
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	1	0	1C
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	1	0	1E
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	9	1	1F
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	4	0	2A
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	1	0	2B
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	3	1	2C
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	7	0	2D
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	2	0	2E
animals	reptiles	Elapidae	Pseudechis guttatus	Carpentaria whip snake	C	3	0	1C
animals	reptiles	Elapidae	Rhinoplocephalus boschmai	Carpentaria whip snake	C	2	0	1D
animals	reptiles	Elapidae	Rhinoplocephalus boschmai	Carpentaria whip snake	C	3	1	1E
animals	reptiles	Elapidae	Rhinoplocephalus boschmai	Carpentaria whip snake	C	5	0	1F
animals	reptiles	Elapidae	Rhinoplocephalus boschmai	Carpentaria whip snake	C	5	0	2A
animals	reptiles	Scincidae	Tiliqua rugosa		C	1	0	1E
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C	1	0	1A
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C	1	0	1C
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C	6	0	1E

animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C		3	1	1F
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C		1	0	2C
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C		2	0	2D
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C		1	0	2F
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		5	0	1C
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		3	0	1D
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		15	0	1E
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		9	0	1F
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		13	0	2A
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		4	0	2C
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C		31	0	2D
animals	birds	Burhinidae	Burhinus grallarius	bush stone-curlew	C		1	0	1A
animals	birds	Burhinidae	Burhinus grallarius	bush stone-curlew	C		2	0	2A
animals	birds	Burhinidae	Burhinus grallarius	bush stone-curlew	C		3	0	2D
animals	birds	Burhinidae	Burhinus grallarius	bush stone-curlew	C		3	0	2F
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		2	1	1A
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		5	0	1D
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		5	0	1E
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		12	0	1F
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		16	0	2A
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		7	0	2B
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		3	0	2C
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		68	0	2D
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		2	0	2E
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C		30	0	2F
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		3	0	1B
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		1	0	1C
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		4	0	2A
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		1	0	2B
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		2	0	2C
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		4	0	2D
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C		1	0	2E
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	C		1	0	1F
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	C		3	0	2A
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	C		1	0	2B
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	C		9	0	2D
animals	birds	Strigidae	Ninox connivens	barking owl	C		1	0	1D
animals	birds	Strigidae	Ninox connivens	barking owl	C		5	0	2D
animals	birds	Strigidae	Ninox connivens	barking owl	C		2	0	2F
animals	birds	Pomatostomidae	Pomatostomus superciliosus	white-browed babbler	C		1	0	1C
animals	birds	Pomatostomidae	Pomatostomus superciliosus	white-browed babbler	C		1	0	1E
animals	birds	Pomatostomidae	Pomatostomus superciliosus	white-browed babbler	C		1	0	2C
animals	birds	Pomatostomidae	Pomatostomus superciliosus	white-browed babbler	C		1	0	2E
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		10	0	1A
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		12	0	1B
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		4	0	1C
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		19	0	1D
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		15	0	1E
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		40	0	1F
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		50	0	2A
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		28	0	2B
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		6	0	2C
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		145	0	2D
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		34	0	2E
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C		20	0	2F
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler (eastern)	C		1	0	2A
animals	birds	Estrildidae	Stagonopleura guttata	diamond firetail	C		2	1	1A
animals	birds	Estrildidae	Stagonopleura guttata	diamond firetail	C		5	0	2A



animals	birds	Estlridae	Stagonopleura guttata	diamond fretail	C	3	0	2B
animals	birds	Estlridae	Stagonopleura guttata	diamond fretail	C	5	0	2D
animals	birds	Estlridae	Stagonopleura guttata	diamond fretail	C	1	0	2E
animals	birds	Tytonidae	Tyto novaehollandiae novaehollandiae	masked owl (southern subspecies)	C	1	0	2A
animals	birds	Tytonidae	Tyto novaehollandiae novaehollandiae	masked owl (southern subspecies)	C	1	0	2F
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	3	0	1A
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	4	0	1B
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	5	0	1D
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	4	0	1F
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	3	1	2A
animals	mammals	Potoroidae	Aepyprymmus rufescens	rufous beltong	C	1	0	2B
animals	mammals	Vesperilionidae	Chalinobius nigrogriseus	hoary wattled bat	C	1	0	2D
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	4	0	1A
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	4	0	1B
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	7	0	1D
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	1	0	1E
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	14	0	1F
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	2	0	2A
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	1	0	2C
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	5	0	2D
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	1	0	2F
animals	mammals	Vesperilionidae	Miniopterus australis	little bent-wing bat	C	1	0	2D
animals	mammals	Vesperilionidae	Miniopterus schreibersii oceanensis	eastern bent-wing bat	C	2	1	1A
animals	mammals	Ornithorhynchidae	Ornithorhynchus anatinus	platypus	C	2	0	1A
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	2	0	1A
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	2	0	1D
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	5	0	1F
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	2	0	2B
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	1	0	2D
animals	mammals	Petauridae	Petaurus australis australis	yellow-bellied glider (southern subspecies)	C	2	0	1F
animals	mammals	Petauridae	Petaurus norfolcensis	squirrel glider	C	1	0	1D
animals	mammals	Petauridae	Petaurus norfolcensis	squirrel glider	C	2	0	2D
animals	mammals	Dasyuridae	Phascogale tapoatafa	brush-tailed phascogale	C	2	0	2D
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	11	0	1B
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	1	0	1C
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	2	0	1D
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	1	0	1E
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	13	0	1F
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	7	0	2A
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	3	0	2B
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	12	0	2D
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	2	0	2E
animals	mammals	Phascolartidae	Phascolartos cinereus	koala	C	2	0	2F
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	1	0	1D
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	5	0	1E
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	2	1	1F
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	2	0	2A
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	2	0	2B
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	10	2	2D
animals	mammals	Muridae	Pseudomys patrius	eastern pebble-mound mouse	C	1	0	1B
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	1	0	1A
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	8	0	1B
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	3	0	1D
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	1	0	1E
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	2	0	1F
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	1	0	2A
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	1	0	2B

animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C		2	0	2D
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C		2	0	2E
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C		1	0	2F
animals	mammals	Vespertilionidae	Vespertilius regulus	southern forest bat	C		1	0	2D

**WildNet Species List for an Area**  
**Extracted: 14/07/2009**

Location: As per provided shape file  
 Rare and threatened species under NCA & EPBC

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Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	End	Recs
plants	conifers	Cupressaceae	<i>Callitris baileyi</i>	Bailey's cypress	R		U	1
plants	higher dicots	Asteraceae	<i>Rutidosia lanata</i>		E		U	4
plants	higher dicots	Caesalpiniaceae	<i>Senna acclinis</i>		R		U	1
plants	higher dicots	Celastraceae	<i>Denhamia parvifolia</i>		V	V	U	1
plants	higher dicots	Haloragaceae	<i>Gonocarpus urceolatus</i>		V		U	5
plants	higher dicots	Lamiaceae	<i>Prostanthera</i> sp. (Dunmore D.M.Gordon 8A)		V	V	U	3
plants	higher dicots	Mimosaceae	<i>Acacia chinchillensis</i>		V	V	U	16
plants	higher dicots	Mimosaceae	<i>Acacia curranii</i>	curly-bark wattle	V	V	U	13
plants	higher dicots	Mimosaceae	<i>Acacia spania</i>		R		U	1
plants	higher dicots	Mimosaceae	<i>Acacia tenuinervis</i>		R		U	6
plants	higher dicots	Mimosaceae	<i>Acacia wardellii</i>		V	V	U	25
plants	higher dicots	Myrtaceae	<i>Calytrix gurlumundensis</i>		V	V	U	18
plants	higher dicots	Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett mallee	R		U	9
plants	higher dicots	Myrtaceae	<i>Eucalyptus dunnii</i>	Dunn's white gum	R		U	1
plants	higher dicots	Myrtaceae	<i>Homoranthus papillatus</i>	mouse bush	R		U	1
plants	higher dicots	Myrtaceae	<i>Melaleuca irbyana</i>		R		U	1
plants	higher dicots	Myrtaceae	<i>Micromyrtus carinata</i>	Gurulmundi heath-myrtle	E		U	24
plants	higher dicots	Rhamnaceae	<i>Cryptandra ciliata</i>		R		U	2
plants	higher dicots	Rutaceae	<i>Philotheca sporadica</i>		V	V	U	32
plants	higher dicots	Solanaceae	<i>Solanum papaverifolium</i>		E		U	1
plants	higher dicots	Solanaceae	<i>Solanum stenopterum</i>		V		U	1
plants	higher dicots	Surianaceae	<i>Cadellia pentastylis</i>	ooline	V	V	U	26
plants	monocots	Aponogetonaceae	<i>Aponogeton queenslandicus</i>		R		U	2
plants	monocots	Cyperaceae	<i>Cyperus clarus</i>		V		U	1
plants	monocots	Cyperaceae	<i>Fimbristylis vagans</i>		R		U	1
plants	monocots	Orchidaceae	<i>Diuris tricolor</i>		C	V	U	2
plants	monocots	Poaceae	<i>Bothriochloa biloba</i>		C	V	U	1
plants	monocots	Poaceae	<i>Homopholis belsonii</i>		E	V	U	3
animals	amphibians	Hylidae	<i>Cyclorana verrucosa</i>	rough collared frog	R		QA	22
animals	birds	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk	R		QA	10
animals	birds	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk	E	V	QA	4
animals	birds	Accipitridae	<i>Lophoictinia isura</i>	square-tailed kite	R		QA	54
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-geese	R		QA	3
animals	birds	Anatidae	<i>Stictonetta naevosa</i>	freckled duck	R		QA	2
animals	birds	Cacatuidae	<i>Calyptorhynchus lathami</i>	glossy black-cockatoo	V		QA	61
animals	birds	Cacatuidae	<i>Lophochroa leadbeateri</i>	Major Mitchell's cockatoo	V		QA	4
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork	R		QA	40
animals	birds	Estrildidae	<i>Poephila cincta cincta</i>	black-throated finch (white-rumped subspecies)	V	E	QA	2
animals	birds	Falconidae	<i>Falco hypoleucos</i>	grey falcon	R		QA	4
animals	birds	Meliphagidae	<i>Anthochaera phrygia</i>	regent honeyeater	E	E	QA	1
animals	birds	Meliphagidae	<i>Grantiella picta</i>	painted honeyeater	R		QA	25
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater	R		QA	7
animals	birds	Pedionomidae	<i>Pedionomus torquatus</i>	plains-wanderer	V	V	QA	1

Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	End	Recs
animals	birds	Psittacidae	<i>Lathamus discolor</i>	swift parrot	E	E	QA	5
animals	birds	Psittacidae	<i>Neophema pulchella</i>	turquoise parrot	R		QA	12
animals	birds	Rallidae	<i>Lewinia pectoralis</i>	Lewin's rail	R		QAI	3
animals	birds	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe	V	V	QA	3
animals	birds	Strigidae	<i>Ninox strenua</i>	powerful owl	V		QA	2
animals	bony fish	Percichthyidae	<i>Maccullochella peelii peelii</i>	Murray cod		V	QA	1
animals	insects	Lycaenidae	<i>Jalmenus eubulus</i>	pale imperial hairstreak	V		QA	11
animals	mammals	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)	V	E	QA	1
animals	mammals	Megadermatidae	<i>Macroderma gigas</i>	ghost bat	V		QA	1
animals	mammals	Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	QA	1
animals	mammals	Vespertilionidae	<i>Chalinolobus dwyeri</i>	large-eared pied bat	R	V	QA	1
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat	R		QA	19
animals	mammals	Vespertilionidae	<i>Nyctophilus timoriensis</i>	eastern long-eared bat	V	V	QAI	6
animals	mammals	Vombatidae	<i>Lasiorhinus krefftii</i>	northern hairy-nosed wombat	E	E	QA	1
animals	reptiles	Boidae	<i>Aspidites ramsayi</i>	woma	R		QA	15
animals	reptiles	Elapidae	<i>Acanthophis antarcticus</i>	common death adder	R		QA	3
animals	reptiles	Elapidae	<i>Furina dunmalli</i>	Dunmall's snake	V	V	Q	4
animals	reptiles	Elapidae	<i>Hemiaspis damelii</i>	grey snake	E		QA	6
animals	reptiles	Gekkonidae	<i>Strophurus taenicauda</i>	golden-tailed gecko	R		Q	78
animals	reptiles	Pygopodidae	<i>Paradelma orientalis</i>	brigalow scaly-foot	V	V	Q	17
animals	reptiles	Scincidae	<i>Egernia rugosa</i>	yakka skink	V	V	Q	5
animals	reptiles	Scincidae	<i>Ophioscincus truncatus</i>		R		QA	5

## CODES

**NCA** - The conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the wild (PE), Endangered (E), Vulnerable (V), Rare (R), Near threatened (NT); Least concern (C) or Not Protected ( ).

Note: For incomplete taxa such as a genus (eg *Litoria* or *Acacia*) no status value is assigned.

**EPBC** - The conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*.

The codes are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW), Vulnerable (V) and Threatened (includes taxa listed as CD, CE, E, EX, V and XW).

**End** - Native taxa (Queensland Endemic - Q, Intranational - QA, Regional Endemic - QI or Not Endemic to Australia - QAI), Vagrant taxa - (Vagrant (International) - VI, Vagrant (Intranational) - VA or Vagrant (Unknown) - VU), Introduced or naturalised in the wild taxa (Introduced (International) - II, Introduced (Intranational) - IA or Introduced (Unknown) - IU) or Exotic taxa not known to be naturalised - (Exotic (International) - XI, Exotic (Intranational) - XA or Exotic (Unknown) - XU) or Unknown endemicity (U).

**Recs** - The number of records of the taxon within the area search within WildNet. Note: This is not the number of individuals of a taxon encountered.

**When acknowledging WildNet Data please use the following:**

Department of Environment and Resource Management (2009) WildNet. (Database).

Department of Environment and Resource Management, Brisbane. 14th July 2009

**WildNet Species List for an Area**  
**Provided: 11/08/2009**

Location: As per provided shape file  
 Non-EVR Priority Species for the BBS Bioregion

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Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC
plants	higher dicots	Mimosaceae	Acacia omalophylla		C	
plants	higher dicots	Mimosaceae	Acacia shirleyi	lancewood	C	
plants	higher dicots	Myrtaceae	Corymbia bloxsomei		C	
plants	higher dicots	Myrtaceae	Corymbia bloxsomei x C.citriodora		C	
plants	higher dicots	Sapindaceae	Dodonaea macrocarpa		C	
plants	higher dicots	Myrtaceae	Eucalyptus camaldulensis		C	
plants	higher dicots	Myrtaceae	Eucalyptus rhombica		C	
animals	amphibians	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	
animals	amphibians	Myobatrachidae	Uperoleia fusca	dusky gungan	C	
animals	birds	Burhinidae	Burhinus grallarius	bush stone-curlew	C	
animals	birds	Acanthizidae	Chthonicola sagittata	speckled warbler	C	
animals	birds	Climacteridae	Climacteris picumnus	brown treecreeper	C	
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	C	
animals	birds	Strigidae	Ninox connivens	barking owl	C	
animals	birds	Pomatostomidae	Pomatostomus superciliosus	white-browed babbler	C	
animals	birds	Pomatostomidae	Pomatostomus temporalis	grey-crowned babbler	C	
animals	birds	Estrildidae	Stagonopleura guttata	diamond firetail	C	
animals	birds	Tytonidae	Tyto longimembris	eastern grass owl	C	
animals	birds	Tytonidae	Tyto novaehollandiae novaehollandiae	masked owl (southern subspecies)	C	
animals	mammals	Potoroidae	Aepyprymnus rufescens	rufous bettong	C	
animals	mammals	Vespertilionidae	Chalinolobus nigrogriseus	hoary wattled bat	C	
animals	mammals	Peramelidae	Isoodon macrourus	northern brown bandicoot	C	
animals	mammals	Macropodidae	Macropus dorsalis	black-striped wallaby	C	
animals	mammals	Vespertilionidae	Miniopterus australis	little bent-wing bat	C	
animals	mammals	Vespertilionidae	Miniopterus schreibersii oceanensis	eastern bent-wing bat	C	
animals	mammals	Ornithorhynchidae	Ornithorhynchus anatinus	platypus	C	
animals	mammals	Peramelidae	Perameles nasuta	long-nosed bandicoot	C	
animals	mammals	Pseudocheiridae	Petauroides volans	greater glider	C	
animals	mammals	Petauridae	Petaurus australis australis	yellow-bellied glider (southern subspecies)	C	
animals	mammals	Petauridae	Petaurus norfolcensis	squirrel glider	C	
animals	mammals	Dasyuridae	Phascogale tapoatafa	brush-tailed phascogale	C	
animals	mammals	Phascolarctidae	Phascolarctos cinereus	koala	C	
animals	mammals	Dasyuridae	Planigale tenuirostris	narrow-nosed planigale	C	
animals	mammals	Pseudocheiridae	Pseudocheirus peregrinus	common ringtail possum	C	
animals	mammals	Muridae	Pseudomys patrius	eastern pebble-mound mouse	C	
animals	mammals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	
animals	mammals	Vespertilionidae	Vespadelus regulus	southern forest bat	C	
animals	reptiles	Agamidae	Amphibolurus burnsii		C	
animals	reptiles	Agamidae	Chlamydosaurus kingii	frilled lizard	C	
animals	reptiles	Scincidae	Ctenotus ingrami		C	
animals	reptiles	Scincidae	Cyclodomorphus gerrardii	pink-tongued lizard	C	
animals	reptiles	Pygopodidae	Delma plebeia	common delma	C	
animals	reptiles	Chelidae	Emydura macquarii krefftii	Krefft's river turtle	C	
animals	reptiles	Chelidae	Emydura macquarii macquarii	Murray turtle	C	
animals	reptiles	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	
animals	reptiles	Chelidae	Macrochelodina expansa	broad-shelled river turtle	C	



animals	reptiles	Agamidae	Physignathus lesueurii	eastern water dragon	C	
animals	reptiles	Elapidae	Pseudechis guttatus	spotted black snake	C	
animals	reptiles	Elapidae	Rhinoplocephalus boschmai	Carpentaria whip snake	C	
animals	reptiles	Scincidae	Tiliqua rugosa aspera	shingle-back (eastern subspecies)	C	
animals	reptiles	Varanidae	Varanus panoptes	yellow-spotted monitor	C	

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Combined Queensland Museum Database Search Results for Significant Species for Lat 25° 34' to 27° 06' and Long 148° 48' to 150° 07' and for Lat 26° 32' to 28° 01' and Long 150° 07' to 151° 07'										
Class	Family	Genus	Species	Locality Name	Latitude	Longitude	Field Coll Date	EPBC	NCA	BAMM (BRBS)
Frogs	Hylidae	Cyclorana	verrucosa	Oil Cellar, Moonie Oil Field	-27.75	150.25	9-Jan-79		R	
Frogs	Hylidae	Cyclorana	verrucosa	Moonie Hwy, N of Moonie	-27.59	150.54	16-Dec-01		R	
Frogs	Hylidae	Cyclorana	verrucosa	Moonie Hwy, N of Moonie	-27.55	150.61	16-Dec-01		R	
Frogs	Hylidae	Cyclorana	verrucosa	Dalby, 18km W	-27.43	151.1	8-Feb-64		R	
Frogs	Hylidae	Cyclorana	verrucosa	nr Lk Broadwater Rd, Moonie Highway Junction	-27.32	151	20-Nov-92		R	
Frogs	Hylidae	Cyclorana	verrucosa	Warrabee, nr Petrie (?)	-26.83	150.15	8-Jan-64		R	
Frogs	Hylidae	Cyclorana	verrucosa	Warrabee, nr Petrie (?)	-26.83	150.15	9-Feb-64		R	
Frogs	Hylidae	Cyclorana	verrucosa	Warrabee, nr Petrie (?)	-26.83	150.15	10-Feb-64		R	
Frogs	Hylidae	Cyclorana	verrucosa	Aklow 30km S Dulacca	-26.79	149.72	2-Dec-95		R	
Frogs	Hylidae	Cyclorana	verrucosa	Barakula Rd, via Chinchilla	-26.62	150.58	27-Dec-99		R	
Frogs	Limnodynastidae	Limnodynastes	salmini	Southwood NP, nr Moonie	-27.83	150.18	13-Jan-72		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Oil Cellar, Moonie Oil Field	-27.75	150.25	12-Jan-79		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Moonie Hwy, N of Moonie	-27.59	150.54	16-Dec-01		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Lake Broadwater, via Dalby	-27.35	151.1	Aug-84		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	2km N of L Broadwater, via Dalby	-27.33	151.1	19-Sep-76		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Wilkie Ck, 24Km S of Dalby	-27.28	151.03	9-Mar-64		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Wilkie Ck, 24Km SW of Dalby	-27.28	151.03	9-Mar-64		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	9km N of L Broadwater, via Dalby	-27.27	151.1	19-Sep-76		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Condamine	-26.93	150.13	3-Feb-62		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Condamine Plains	-26.93	150.13	16-Nov-63		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Chinchilla	-26.68	150.63	21-Mar-81		X	
Frogs	Limnodynastidae	Limnodynastes	salmini	Richon Sin	-25.85	149.38	22-Mar-79		X	
Frogs	MYOBATRACHIDAE	Uperoleia	fusca	Lake Broadwater, via Dalby	-27.35	151.12	22 Feb 1986-25 Feb 1986		X	
Reptiles	Elapidae	Acanthophis	antarcticus	Millmerran to Goondiwindi	-28	150.83			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Tara	-27.28	150.47			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Brigalow	-26.85	150.78			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Chinchilla	-26.73	150.63			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Dulacca	-26.65	149.77			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Dalacea	-26.65	149.77			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Yuleba	-26.62	149.38			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Wallumbilla	-26.58	149.18			R	
Reptiles	Elapidae	Acanthophis	antarcticus	Taroona	-25.65	149.8	01 Sep 1968-30 Sep 1968		R	
Reptiles	AGAMIDAE	Amphibolurus	muricata	Moorbindah Stn, SW of Taroona	-25.88	149.32	9-Jun-77		X	
Reptiles	PYTHONIDAE	Aspidites	ramsayi	Warkon, Yuleba	-27	149.5			R	
Reptiles	PYTHONIDAE	Aspidites	ramsayi	Rosstock Hstd, S Yuleba	-26.92	149.43	22-Apr-95		R	
Reptiles	PYTHONIDAE	Aspidites	ramsayi	Old Roma-Surat Rd., ~1.0km S Roselea t'off	-26.76	148.82	01 Oct 1996-31 Oct 1996		R	
Reptiles	PYTHONIDAE	Aspidites	ramsayi	Yuleba-Surat Rd, 12 km S Yuleba	-26.68	149.32	14-Mar-99		R	
Reptiles	PYTHONIDAE	Aspidites	ramsayi	Yuleba	-26.62	149.38			R	
Reptiles	CHELUIDAE	Chelodina	expansa	Weir River, Nth of Goondiwindi, 'Burilda Station'	-27.68	150.7	28-Aug-87		X	
Reptiles	Elapidae	Cryptophis	boschmai	Kooyong via Monto	-27.33	150.33			X	
Reptiles	Elapidae	Cryptophis	boschmai	Yuleba township area	-26.61	149.37	21-Mar-95		X	
Reptiles	Elapidae	Cryptophis	boschmai	Boort-Koi Stn, Miles	-26.58	150.4			X	
Reptiles	Scincidae	Ctenotus	ingrami	Yuleba SF, via Roma	-26.91	149.75	12-Nov-98		X	
Reptiles	Scincidae	Ctenotus	ingrami	Yuleba SF, via Roma	-26.78	149.55	13-Nov-98		X	
Reptiles	Scincidae	Ctenotus	ingrami	Edge of Yuleba SF	-26.72	149.33	20-Mar-95		X	
Reptiles	Scincidae	Ctenotus	ingrami	Yuleba SF	-26.5	149.33	20-Mar-95		X	
Reptiles	Scincidae	Cyclodomorphus	gerrardii	L Broadwater, 7km N	-27.32	151.07	15-Feb-91		X	
Reptiles	Scincidae	Cyclodomorphus	gerrardii	Taroona	-25.65	149.8			X	
Reptiles	PYGOPODIDAE	Delma	plebeia	Brisbane, Stafford Hts	-27.38	151.02	13-Feb-81		X	
Reptiles	PYGOPODIDAE	Delma	plebeia	The Gums, Yaramba Stn	-27.33	150.18			X	
Reptiles	PYGOPODIDAE	Delma	plebeia	Rywang, via Chinchilla	-26.68	150.47			X	
Reptiles	Scincidae	Egernia	nugosa	Rockwood Stn, 32km SW Chinchilla	-26.93	150.37		V	V	
Reptiles	Scincidae	Egernia	nugosa	Barondah - Dawson R Crossing	-25.7	149.2	2-Nov-79		V	
Reptiles	Elapidae	Furina	dunnalli	Old Condamine Hwy, 5kms E 1st Chinchilla t'ff	-26.9	150.52	18-Jan-00		V	
Reptiles	Elapidae	Furina	dunnalli	Miles	-26.67	150.18	01 Dec 1978-31 Dec 1978		V	

Class	Family	Genus	Species	Locality Name	Latitude	Longitude	Field Coll Date	EPBC NCA	BAMM (BRBS)	
Reptiles	Elapidae	Hemiaspis	damelli	The Gums Stn, via Tara	-27.33	150.2	17-Mar-83	E		
Reptiles	Elapidae	Hemiaspis	damelli	Tara	-27.28	150.47	01 Dec 1979-31 Dec 1979	E		
Reptiles	Elapidae	Hemiaspis	damelli	Tara	-27.28	150.47	01 Oct 1980-31 Oct 1980	E		
Reptiles	Elapidae	Hemiaspis	damelli	Tara	-27.28	150.47	01 Feb 1985-28 Feb 1985	E		
Reptiles	Elapidae	Hemiaspis	damelli	Tara	-27.28	150.47	14-Mar-89	E		
Reptiles	Elapidae	Hemiaspis	damelli	The Gums	-27.28	150.23	1-Dec-01	E		
Reptiles	Elapidae	Hemiaspis	damelli	Moonte, Moonie Motel	-27.27	150.32	30-Mar-73	E		
Reptiles	Elapidae	Hemiaspis	damelli	Kogan, 26km S, on Tara Rd	-27.15	150.63	11-Oct-85	E		
Reptiles	Elapidae	Hemiaspis	damelli	Rockwood Stn, Chinchilla	-26.93	150.37		E		
Reptiles	Elapidae	Hemiaspis	damelli	Elhma, via Warra	-26.9	150.87		E		
Reptiles	Elapidae	Hemiaspis	damelli	Jandowae	-26.78	151.12		E		
Reptiles	Elapidae	Hemiaspis	damelli	Chinchilla	-26.73	150.63		E		
Reptiles	Elapidae	Hemiaspis	damelli	Rywyung, via Chinchilla	-26.68	150.47		E		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Southwood NP	-27.83	150.13	8-Mar-72	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Tara, 32km SW	-27.35	150.15		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Tara	-27.28	150.47		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Macalister, Darling Downs	-27.05	151.08		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Condamine	-26.93	150.13		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Jandowae	-26.78	151.12		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Condamine R, 5km SE Chinchilla	-26.77	150.58		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Chinchilla	-26.73	150.63		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Chinchilla, nr	-26.73	150.63		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Chinchilla	-26.73	150.63	20 Apr 1973-25 Apr 1973	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Chinchilla Rifle Range	-26.73	150.63	12-Apr-74	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Columboola, nr Miles	-26.67	150.33		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Miles	-26.67	150.18		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Miles Area	-26.67	150.18		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Miles	-26.67	150.18	20-May-88	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Googagimbi, via Jackson	-26.65	149.62		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Almoplate, Dulacca	-26.65	149.77		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Goombi, via Chinchilla	-26.65	150.42		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Yuleba	-26.62	149.38		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Yuleba area	-26.62	149.38	25 May 1999 {Reed}	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Pickanjinie	-26.58	149.12		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Roma, 7km NE	-26.52	148.8	29-Nov-79	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Wandoan	-26.12	149.97		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Gulguba, nr Wandoan	-26.12	149.97		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Moorabindah Stn, SW of Taroom	-25.88	149.32	19-May-80	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Yebna Stn, 80km E Injune	-25.68	149.18	24-Jan-77	X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Taroom	-25.65	149.8		X		
Reptiles	Elapidae	Hoplocephalus	bitorquatus	Lawgi, via Rannes	-25.58	149.83		X		
Reptiles	PYGOPODIDAE	Paradeima	orientalis	SF161, Condamine, 2.5kms SE of Wilga Downs Stn	-26.93	150.24	4-Nov-01	V	V	
Reptiles	PYGOPODIDAE	Paradeima	orientalis	Chinchilla area	-26.73	150.63	11-Nov-05	V	V	
Reptiles	AGAMIDAE	Physignathus	lesueuri	Chinchilla, 34km SW	-26.92	150.42	22-Sep-84		X	
Reptiles	AGAMIDAE	Physignathus	lesueuri	Dawson R, Yebna, via Taroom	-25.68	149.18			X	
Reptiles	Elapidae	Pseudechis	guttatus	The Gums Stn, via Tara	-27.33	150.2			X	
Reptiles	Elapidae	Pseudechis	guttatus	The Gums Stn, via Tara	-27.33	150.2	24-Feb-81		X	
Reptiles	Elapidae	Pseudechis	guttatus	Theater Stn, via Dalby	-27.17	151.02	10-Nov-77		X	
Reptiles	Elapidae	Pseudechis	guttatus	Condamine Area	-26.93	150.12	17-Mar-98		X	
Reptiles	Elapidae	Pseudechis	guttatus	Condamine	-26.93	150.13	1-Oct-96		X	
Reptiles	Elapidae	Pseudechis	guttatus	Condamine Area	-26.93	150.12	17-Mar-98		X	
Reptiles	Elapidae	Pseudechis	guttatus	Condamine, 10km W	-26.93	150.22	7-Apr-98		X	
Reptiles	Elapidae	Pseudechis	guttatus	Chinchilla, 30km E	-26.9	150.87			X	
Reptiles	Elapidae	Pseudechis	guttatus	Kooralbyn Stn	-26.8	150.17			X	
Reptiles	Elapidae	Pseudechis	guttatus	Jandowae, Coondambo Stn	-26.78	151.12			X	
Reptiles	Elapidae	Pseudechis	guttatus	Lochabar Stn, via Dalby	-26.75	150.5			X	
Reptiles	Elapidae	Pseudechis	guttatus	Chinchilla	-26.73	150.63			X	



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Reptiles	Elapidae	Pseudechis	guttatus	Allinga area	-26.68	150.63	26-Jul-95			X	
Reptiles	Elapidae	Pseudechis	guttatus	Warrego Hwy, Jackson-Dulacca	-26.64	149.68	22-Dec-97			X	
Reptiles	Elapidae	Pseudechis	guttatus	Wallumbilla	-26.58	149.18	30-Mar-00			X	
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Braemar SF, via Kogan	-27.22	150.83	15 Oct 1979-19 Oct 1979		R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Condamine	-26.93	150.13			R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Rockwood Stn, Chinchilla	-26.93	150.37			R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Rockwood Stn, 32km SW Chinchilla	-26.93	150.37			R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Chinchilla	-26.73	150.63			R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Wonga Hills Stn, via Chinchilla	-26.73	150.63	Mid 1987 (Recd)		R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Chinchilla, 10km N	-26.67	150.58	27-Aug-75		R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Pony Hills SF	-25.83	149.03	17-Jun-77		R		
Reptiles	GEKKONIDAE	Strophurus	taenicauda	Taroom, CWA Hall	-25.65	149.63	20-Jun-96		R		
Reptiles	Scincidae	Tiliqua	rugosa	The Gums, via Tara	-27.33	150.18				X	
Reptiles	Scincidae	Tiliqua	rugosa	Jandowae	-26.78	151.12				X	
Reptiles	Scincidae	Tiliqua	rugosa	Chinchilla	-26.73	150.63				X	
Reptiles	Scincidae	Tiliqua	rugosa	Dulacca	-26.65	149.77				X	
Reptiles	Scincidae	Tiliqua	rugosa	Darling Downs, Rocky Ck	-26.63	149.42				X	
Reptiles	Scincidae	Tiliqua	scincoides	Dulacca	-26.65	149.77				X	
Reptiles	VARANIDAE	Varanus	panoptes	Jackson-Wandoan Rd, 10 km N Warrego Hwy	-26.62	149.64	15-Feb-03			X	
Birds	SYLVIDAE	Acrocephalus	stentoreus	Rockwood, Chinchilla	-26.93	150.37	3-Oct-64	M			
Birds	BURHINIDAE	Burhinus	grallarius	Rockwood, Chinchilla	-26.93	150.37	27-Dec-49			X	
Birds	BURHINIDAE	Burhinus	grallarius	Rockwood, Chinchilla	-26.93	150.37	25-Nov-57			X	
Birds	SCOLOPACIDAE	Calidris	acuminata	Moone R, between Dalby & St George	-27.67	150.27	1886	M			
Birds	CACATUIDAE	Calyptorhynchus	lathamii	Nangram Lgn, Condamine R	-26.93	150.28	6-Oct-54		V		
Birds	CACATUIDAE	Calyptorhynchus	lathamii	Chinchilla	-26.73	150.63		V			
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Rockwood, Chinchilla	-26.93	150.37	6-Sep-67			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Rockwood, Chinchilla	-26.93	150.37	Jan-68			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Jandowae	-26.78	151.12				X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Chinchilla	-26.73	150.63	May 1885			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Chinchilla Rifle Range	-26.73	150.63	5-Mar-62			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Moorabinda Stn	-25.87	149.27	9-Nov-77			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	State Forest, Pony Hills	-25.83	149.03	17-Jun-77			X	
Birds	ACANTHIZIDAE	Cthynicola	sagittata	Rockwood, Chinchilla	-26.93	150.37	14-Oct-62			X	
Birds	CLIMACTERIDAE	Climacteris	pictumnus	Chinchilla	-26.73	150.63	27 Aug 1890			X	
Birds	CLIMACTERIDAE	Climacteris	pictumnus	Chinchilla	-26.73	150.63	27 Aug 1890			X	
Birds	GICONIDAE	Ephippiorhynchus	asiaticus	Humptybong	-27.67	150.77	03 Aug 1886		R		
Birds	SCOLOPACIDAE	Gallinago	hardwickii	Dalby, 27km SW	-27.35	151.1	20-Nov-84	M			
Birds	COLUMBIDAE	Geophaps	scripta	Chinchilla	-26.73	150.63	01 Aug 1890-31 Aug 1890	V	V		
Birds	COLUMBIDAE	Geophaps	scripta	Wallumbilla Ck, Wallumbilla	-26.72	149.2	01 May 1887	V	V		
Birds	COLUMBIDAE	Geophaps	scripta	Durham Downs, N of Roma	-26.08	149.07	11-May-36	V	V		
Birds	APODIDAE	Hirundapus	caudacuta	Dunmore State Forest, W of Cecil Plains	-27.58	150.92	29-Dec-89	M			
Birds	PSITTACIDAE	Lathamus	discolor	Chinchilla	-26.73	150.63	May 1885	E	E		
Birds	ACCIPITRIDAE	Lophocitnia	isura	Wearmbilla Ck, 20 miles SW of Chinchilla	-26.92	150.42	20-Oct-69		R		
Birds	PETROICIDAE	Melanodryas	cuclullata	Rockwood, Chinchilla	-26.93	150.37	20-Aug-60			X	
Birds	PETROICIDAE	Melanodryas	cuclullata	Nangram Lgn, Condamine R	-26.83	150.28	5-Oct-54			X	
Birds	MELIPHAGIDAE	Melithreptus	gularis	Chinchilla	-26.73	150.63	May 1885		R		
Birds	MEROPIIDAE	Merops	ornatus	Western Ck, Forestry Res, Millmerran Shire	-27.83	151.08	9-Nov-71	M			
Birds	MEROPIIDAE	Merops	ornatus	Condamine	-26.93	150.13	25-Aug-78	M			
Birds	MEROPIIDAE	Merops	ornatus	Callitris, Chinchilla	-26.93	150.38	25-Sep-79	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla	-26.73	150.63		M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla	-26.73	150.63	15-Dec-49	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla	-26.73	150.63	10-Oct-54	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla	-26.73	150.63	13-Jan-61	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla Rifle Range	-26.73	150.63	19-Jan-61	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla Rifle Range	-26.73	150.63	22-Jan-61	M			
Birds	MEROPIIDAE	Merops	ornatus	Chinchilla Rifle Range	-26.73	150.63	23-Jan-61	M			
Birds	MONARCHIDAE	Monarcha	melanopsis	Wyobie, between Warra and Jimbour	-26.9	151.08	01 Jul 1977-31 Jul 1977	M			
Birds	MONARCHIDAE	Myiagra	cyanoleuca	Rockwood, Chinchilla	-26.93	150.37	16-Apr-70	M			



Class	Family	Genus	Species	Locality Name	Latitude	Longitude	Field Coll Date	EPBC	NCA	BAMM (BRBS)	
Birds	STRIGIDAE	Ninox	connivens	Chinchilla	-26.73	150.63				X	
Birds	STRIGIDAE	Ninox	connivens	Chinchilla	-26.73	150.63	27 Aug 1890			X	
Birds	STRIGIDAE	Ninox	strenua	Chinchilla	-26.73	150.63	01 May 1885-31 May 1885		V		
Birds	THREKIONITHIDAE	Plegadis	falcinellus	Ducklo, 45Km W of Dalby	-27.25	151	Jan-80	M			
Birds	ESTRILIDAE	Poephila	dincta	Chinchilla	-26.73	150.63	May 1885	E	V		
Birds	POMATOSTOMIDAE	Pomatostomus	superciliosus	Chinchilla	-26.73	150.63	May 1885			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Condamine	-26.93	150.13	30-Aug-50			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Rockwood, Chinchilla	-26.93	150.37	29-Nov-59			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Sunnyglen	-26.87	150.47	7-Oct-54			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Condamine R, 3 miles SE of Chinchilla	-26.8	150.67	14-Apr-58			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla	-26.73	150.63	01 May 1885-31 May 1885			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla	-26.73	150.63	27 Aug 1890			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla Rifle Range	-26.73	150.63	18-Jan-61			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla	-26.73	150.63	27-Jan-69			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla	-26.7	150.62	10-Oct-54			X	
Birds	POMATOSTOMIDAE	Pomatostomus	temporalis	Chinchilla, 4 miles N	-25.68	149.22	3-Nov-79	M			
Birds	MONARCHIDAE	Rhipidura	rufifrons	Dawson R Crossing, Baroondah	-26.93	150.38	12-Jan-71			X	
Birds	ESTRILIDAE	Stagonopleura	guttata	Callitris, Chinchilla	-26.93	150.38				X	
Birds	ESTRILIDAE	Stagonopleura	guttata	Chinchilla	-26.73	150.63				X	
Birds	ESTRILIDAE	Stagonopleura	guttata	State Forest, Pony Hills	-25.83	149.03	11-Mar-80			X	
Birds	SCOLOPACIDAE	Tringa	nebularia	Moonte R, between Dalby & St George	-27.67	150.27	28-Feb-05	M			
Birds	MELIPHAGIDAE	Xanthomyza	phrygia	Chinchilla	-26.73	150.63		E,M	E		
Birds	MELIPHAGIDAE	Xanthomyza	phrygia	Chinchilla	-26.73	150.63	01 May 1885-31 May 1885	E,M	E		
Mammals	Potoridae	Aepyprymus	rufescens	Jackson	-26.65	149.62	2-May-92			X	
Mammals	Vespertilionidae	Chalinobius	picatus	Moorabanda Stn	-25.93	149.2	26-Sep-79	R			
Mammals	Peramelidae	Isoodon	macrourus	Taroomb area	-25.63	149.8				X	
Mammals	Macropodidae	Macropus	dorsalis	Chinchilla	-26.8	150.67				X	
Mammals	Macropodidae	Macropus	dorsalis	Chinchilla, 5km SE	-26.78	150.67				X	
Mammals	Macropodidae	Macropus	dorsalis	Chinchilla, SE	-26.78	150.68				X	
Mammals	Macropodidae	Macropus	dorsalis	Wandoan & Taroomb, btwn	-25.83	149.92				X	
Mammals	Macropodidae	Macropus	dorsalis	Livonia, Taroomb	-25.65	149.75				X	
Mammals	Vespertilionidae	Nyctophilus	timoriensis	Yebna Stn, 80km W Taroomb	-25.68	149.18	24-Sep-68	V	V		
Mammals	Pseudocheiridae	Petauroides	volans	Woleebee, 28.8km from Wandoan	-26.33	149.82	22-Mar-89			X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Condamine Hwy, 30km E Condamine	-26.9	150.37	5-Oct-86			X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Chinchilla	-26.8	150.67	01 Aug 1982-31 Aug 1982			X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Chinchilla, Rifle Range Reserve	-26.73	150.63				X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Chinchilla Rifle Range, Condamine R bank	-26.73	150.63				X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Chinchilla, Rifle Range Reserve	-26.73	150.63	01 Apr 1973-30 Apr 1973			X	
Mammals	Phascolarctidae	Phascolarctos	cinereus	Livonia, Taroomb	-25.65	149.75				X	
Mammals	Dasyuridae	Planigale	tenuirostris	Lake Broadwater	-27.35	151.1				X	
Mammals	Dasyuridae	Planigale	tenuirostris	Dulacca, 10km N	-26.5	149.75	25-Aug-95			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Rockwood, Chinchilla	-26.93	150.37	1-Jun-95			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Condamine R, Rifle Range, Chinchilla	-26.8	150.68	16-Oct-80			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Chinchilla	-26.8	150.67				X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Chinchilla, Rifle Range Reserve	-26.73	150.63				X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Chinchilla, Rifle Range Reserve	-26.73	150.63	3-Jun-71			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Chinchilla Rifle Range	-26.73	150.63	01 Jan 1974-31 Dec 1974			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Yebna Stn, 80km W Taroomb	-25.68	149.18	24-Sep-68			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Ooline Scrub, 9km N Taroomb along Theodore Rd	-25.58	149.77	Jun-96			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Ooline Scrub, 9kms N of Taroomb	-25.58	149.77	15-Jun-96			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Ooline Scrub, N of Taroomb	-25.58	149.77	11-Sep-96			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Ooline Scrub, 9km N of Taroomb along Theodore Rd	-25.58	149.77	12-Jan-97			X	
Mammals	Phalangeridae	Trichosurus	vulpecula	Taroomb	-25.57	149.8	May-95			X	

**Combined Birds Australia Atlas Database Search Results for Significant Species for Lat 25° 34' to 27° 06' and Long 148° 48' to 150° 07' and for Lat 26° 32' to 28° 01' and Long 150° 07' to 151° 07'**

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey Goshawk	Accipiter novaehollandiae	1	Lower Jinghi Back Road	-26.77	151.05	23/04/2003	23/04/2003		R	
Grey Goshawk	Accipiter novaehollandiae		Weir	-26.80	150.58	11/05/2006	12/05/2006		R	
Grey Goshawk	Accipiter novaehollandiae		DandabahCampground	-26.88	151.10	21/09/2007	21/09/2007		R	
Australian Reed-Warbler	Acrocephalus australis	7	Wandoan 'Lake'	-26.12	149.96	24/09/2004	24/09/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Wandoan Environment Park	-26.12	149.96	17/08/2004	17/08/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Waterloo Plain Env Park	-26.12	149.96	14/09/2007	14/09/2007	M		
Australian Reed-Warbler	Acrocephalus australis		Roma	-26.57	148.82	22/07/2000	28/07/2000	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Neverfill	-26.57	148.84	19/09/2007	19/09/2007	M		
Australian Reed-Warbler	Acrocephalus australis		Roma Lower Sewage Works	-26.59	148.80	5/09/1999	5/09/1999	M		
Australian Reed-Warbler	Acrocephalus australis		0 sewage ponds	-26.60	148.80	25/10/2004	25/10/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Roma Sewage Ponds	-26.60	148.81	19/01/2001	19/01/2001	M		
Australian Reed-Warbler	Acrocephalus australis		7 Roma Sewage Farm	-26.60	148.81	3/11/1999	3/11/1999	M		
Australian Reed-Warbler	Acrocephalus australis		Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001	M		
Australian Reed-Warbler	Acrocephalus australis	1	Roma Sewage Works 2	-26.60	148.81	28/10/2000	28/10/2000	M		
Australian Reed-Warbler	Acrocephalus australis		Roma Sewage Works 2	-26.60	148.81	12/06/2000	12/06/2000	M		
Australian Reed-Warbler	Acrocephalus australis		Roma Sewage Works 2	-26.60	148.81	20/01/2000	20/01/2000	M		
Australian Reed-Warbler	Acrocephalus australis		Chinamans Lagoon	-26.67	150.19	29/04/2003	29/04/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Chinchilla CP	-26.74	150.46	11/10/2003	13/10/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Chinchilla Weir	-26.80	150.58	31/10/1999	2/11/1999	M		
Australian Reed-Warbler	Acrocephalus australis		Chinchilla Weir	-26.80	150.58	2/10/1999	2/10/1999	M		
Australian Reed-Warbler	Acrocephalus australis		Chinchilla weir	-26.80	150.51	20/04/2007	20/04/2007	M		
Australian Reed-Warbler	Acrocephalus australis		1 Chinchilla Weir	-26.81	150.58	18/10/2003	18/10/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Chincilla Weir	-26.83	150.42	16/04/2002	17/04/2002	M		
Australian Reed-Warbler	Acrocephalus australis	1	Long Swamp grassdale	-27.30	151.03	23/09/2007	23/09/2007	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Broadwater Caravan Park	-27.34	151.01	8/06/2001	11/06/2001	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Broadwater	-27.35	151.08	28/02/2003	28/02/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Dalby Town	-27.35	151.09	1/11/2004	30/11/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Dalby Town	-27.35	151.09	1/04/2004	29/04/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Dalby	-27.35	151.09	2/12/2003	30/12/2003	M		
Australian Reed-Warbler	Acrocephalus australis		Lake Broadwater Inlet	-27.36	151.10	10/09/2004	10/09/2004	M		
Australian Reed-Warbler	Acrocephalus australis		Thurraggi lagoon	-27.57	150.61	26/08/2003	26/08/2003	M		
Australian Reed-Warbler	Acrocephalus australis	1	St George	-27.75	150.25	25/08/2005	25/08/2005	M		
Australian Reed-Warbler	Acrocephalus australis		Warroa Station 8, Moonie Hwy	-27.84	150.15	17/10/2000	19/10/2000	M		
Fork-tailed Swift	Apus pacificus		L Broadwater CP	-27.36	151.10	26/11/2007	26/11/2007	M		
Fork-tailed Swift	Apus pacificus		L. Broadwater Conservation Park	-27.36	151.10	3/03/2006	3/03/2006	M		
Cattle Egret	Ardea ibis		'Donmorandi'	-26.61	150.78	4/04/1999	5/04/1999	M		
Cattle Egret	Ardea ibis		Maranga	-26.69	151.02	1/01/2003	31/03/2003	M		
Cattle Egret	Ardea ibis		Jandowae Golf Club	-26.72	151.08	18/10/2007	18/10/2007	M		
Cattle Egret	Ardea ibis		Sunset Drive reservoir	-26.76	151.09	31/01/2003	31/01/2003	M		
Cattle Egret	Ardea ibis		741 Surat Dev. Rd.	-27.29	150.37	4/02/2005	4/02/2005	M		

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Cattle Egret	Ardea ibis	1	Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Cattle Egret	Ardea ibis		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
Cattle Egret	Ardea ibis		L Broadwater CP	-27.36	151.10	26/11/2007	26/11/2007	M		
Cattle Egret	Ardea ibis		Lake Broadwater Inlet	-27.36	151.10	13/04/2000	13/04/2000	M		
Cattle Egret	Ardea ibis	1	Memorial Hall lagoon	-27.84	150.19	17/01/2002	17/01/2002	M		
Eastern Great Egret	Ardea modesta		Taroorn	-25.64	149.79	14/08/2004	16/08/2004	M		
Eastern Great Egret	Ardea modesta		Taroorn Caravan Park	-25.64	149.79	19/10/2000	20/10/2000	M		
Eastern Great Egret	Ardea modesta		Taroorn Caravan Park	-25.64	149.79	12/10/2000	13/10/2000	M		
Eastern Great Egret	Ardea modesta	2	Waikola	-26.03	149.25	25/12/2004	1/01/2005	M		
Eastern Great Egret	Ardea modesta		Pameroo Station	-26.05	148.83	24/12/2001	24/12/2001	M		
Eastern Great Egret	Ardea modesta		Wandoan 'Lake'	-26.12	149.96	24/09/2004	24/09/2004	M		
Eastern Great Egret	Ardea modesta		Waterloo Plain Env Park	-26.12	149.96	14/09/2007	14/09/2007	M		
Eastern Great Egret	Ardea modesta	1	Roma	-26.57	148.82	22/07/2000	28/07/2000	M		
Eastern Great Egret	Ardea modesta		1 Roma Sewage Farm	-26.60	148.81	3/11/1999	3/11/1999	M		
Eastern Great Egret	Ardea modesta		1 Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001	M		
Eastern Great Egret	Ardea modesta		'Donmorandi'	-26.61	150.78	4/04/1999	5/04/1999	M		
Eastern Great Egret	Ardea modesta	1	Judd's Lagoon Yuleba	-26.64	149.40	11/11/2007	12/11/2007	M		
Eastern Great Egret	Ardea modesta		Judd's Lagoon	-26.64	149.40	15/06/1999	16/06/1999	M		
Eastern Great Egret	Ardea modesta		Judd's Lagoon	-26.64	149.39	16/06/1999	16/06/1999	M		
Eastern Great Egret	Ardea modesta		2 km N of Miles	-26.65	150.18	1/01/2007	4/01/2007	M		
Eastern Great Egret	Ardea modesta	1	RJ Simpson Bridge	-26.66	150.18	11/09/2005	11/09/2005	M		
Eastern Great Egret	Ardea modesta		Chinamans Lagoon	-26.67	150.19	29/04/2003	29/04/2003	M		
Eastern Great Egret	Ardea modesta		Old man Lagoon	-26.69	150.69	16/11/1999	16/11/1999	M		
Eastern Great Egret	Ardea modesta		Maranga	-26.69	151.02	1/01/2003	31/03/2003	M		
Eastern Great Egret	Ardea modesta	1	Regrowth by lagoon	-26.72	150.60	26/07/1998	26/07/1998	M		
Eastern Great Egret	Ardea modesta		Regrowth by lagoon	-26.72	150.60	27/07/1997	27/07/1997	M		
Eastern Great Egret	Ardea modesta		Dogwood Creek, Glenafton Road, via Miles	-26.72	150.18	7/04/1999	7/04/1999	M		
Eastern Great Egret	Ardea modesta		Charley's Ck	-26.74	150.62	22/09/2004	22/09/2004	M		
Eastern Great Egret	Ardea modesta	3	Boshammer Walk, Chinchilla	-26.75	150.64	20/03/1999	20/03/1999	M		
Eastern Great Egret	Ardea modesta		Lower Jinghi Back Road	-26.76	151.03	28/03/2001	28/03/2001	M		
Eastern Great Egret	Ardea modesta		Jingi Creek, via Jandowae	-26.77	151.04	7/05/1999	7/05/1999	M		
Eastern Great Egret	Ardea modesta		Roadside brigalow	-26.77	150.93	6/04/2005	6/04/2005	M		
Eastern Great Egret	Ardea modesta	7	Brigalow Corridor	-26.77	150.93	6/12/2007	6/12/2007	M		
Eastern Great Egret	Ardea modesta		Bimbimbi	-26.77	150.48	3/10/1999	3/10/1999	M		
Eastern Great Egret	Ardea modesta		7 Chinchilla Weir	-26.80	150.57	10/04/1999	10/04/1999	M		
Eastern Great Egret	Ardea modesta		3 Chinchilla Weir	-26.80	150.58	14/03/2009	15/04/2009	M		
Eastern Great Egret	Ardea modesta	1	Condamine River	-26.80	150.68	20/10/2001	20/10/2001	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir, Condamine River	-26.80	150.58	25/08/1999	25/08/1999	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	9/07/1999	9/07/1999	M		
Eastern Great Egret	Ardea modesta		Archers crossing	-26.80	150.68	13/05/2007	13/05/2007	M		
Eastern Great Egret	Ardea modesta	1	Chincilla Weir, Condamine River	-26.80	150.58	18/07/2001	19/07/2001	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	11/08/2004	11/08/2004	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	14/09/2001	15/09/2001	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	31/10/1999	21/11/1999	M		
Eastern Great Egret	Ardea modesta	1	Chinchilla Weir	-26.80	150.58	22/05/2004	23/05/2004	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	3/04/2001	3/04/2001	M		

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Eastern Great Egret	Ardea modesta		Chinchilla Weir Condamine River	-26.80	150.58	2/09/2005	2/09/2005	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	13/04/2001	13/04/2001	M		
Eastern Great Egret	Ardea modesta		Weir	-26.80	150.58	11/05/2006	12/05/2006	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	12/10/2003	12/10/2003	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	27/04/2003	27/04/2003	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.80	150.58	13/08/2005	15/08/2005	M		
Eastern Great Egret	Ardea modesta		Chinchilla Weir	-26.81	150.58	18/10/2003	18/10/2003	M		
Eastern Great Egret	Ardea modesta	2	Chinchilla Weir	-26.83	150.42	16/04/2002	17/04/2002	M		
Eastern Great Egret	Ardea modesta		Condamine River, Banana Bridge	-26.85	150.77	17/09/2001	17/09/2001	M		
Eastern Great Egret	Ardea modesta		Condamine	-26.93	150.13	27/11/2000	27/11/2000	M		
Eastern Great Egret	Ardea modesta		Condamine	-26.93	150.13	23/06/2001	23/06/2001	M		
Eastern Great Egret	Ardea modesta		Wilke Ck Coal Mine	-27.04	150.96	20/01/2007	20/01/2007	M		
Eastern Great Egret	Ardea modesta		Surat - Roma Road	-27.07	149.11	10/07/2002	10/07/2002	M		
Eastern Great Egret	Ardea modesta		Surat waterfills, Camarvon Hwy	-27.08	149.09	25/10/1999	25/10/1999	M		
Eastern Great Egret	Ardea modesta		Tara Crossroads	-27.25	150.25	20/10/2007	20/10/2007	M		
Eastern Great Egret	Ardea modesta		4 Bar property, Moonie Hwy, Kumbarilla	-27.33	150.93	16/10/2001	16/10/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.33	151.10	27/10/2005	31/10/2005	M		
Eastern Great Egret	Ardea modesta		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.33	151.10	14/03/2000	14/03/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001	M		
Eastern Great Egret	Ardea modesta		The Gums Reserve	-27.34	150.19	11/03/1999	13/03/1999	M		
Eastern Great Egret	Ardea modesta		The Gums Lagoon	-27.34	150.20	12/08/2000	12/08/2000	M		
Eastern Great Egret	Ardea modesta		The Gums	-27.34	150.20	28/09/1999	28/09/1999	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Eastern Great Egret	Ardea modesta	1		-27.35	151.10	14/01/1999	14/01/1999	M		
Eastern Great Egret	Ardea modesta	2	Lake Broadwater	-27.35	151.10	30/10/1996	30/10/1996	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater	-27.35	151.10	19/06/1996	19/06/1996	M		
Eastern Great Egret	Ardea modesta	4	Lake Broadwater	-27.35	151.10	18/04/1996	18/04/1996	M		
Eastern Great Egret	Ardea modesta	10	Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
Eastern Great Egret	Ardea modesta	4	Lake Broadwater	-27.35	151.10	31/10/1995	31/10/1995	M		
Eastern Great Egret	Ardea modesta	2	Lake Broadwater	-27.35	151.10	26/09/1995	26/09/1995	M		
Eastern Great Egret	Ardea modesta	6	Lake Broadwater	-27.35	151.10	30/07/1995	30/07/1995	M		
Eastern Great Egret	Ardea modesta	5	Lake Broadwater	-27.35	151.10	13/05/1995	13/05/1995	M		
Eastern Great Egret	Ardea modesta	11	Lake Broadwater	-27.35	151.10	30/03/1995	30/03/1995	M		
Eastern Great Egret	Ardea modesta	6	Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995	M		
Eastern Great Egret	Ardea modesta	4	Lake Broadwater	-27.35	151.10	15/10/1994	15/10/1994	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater	-27.35	151.10	21/08/1994	21/08/1994	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.08	28/02/2003	28/02/2003	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
Eastern Great Egret	Ardea modesta		Dalby Town	-27.35	151.09	1/11/2004	30/11/2004	M		
Eastern Great Egret	Ardea modesta		Dalby Town	-27.35	151.09	1/04/2004	29/04/2004	M		
Eastern Great Egret	Ardea modesta		Broadwater Park	-27.35	151.09	28/10/2003	28/10/2003	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.09	21/04/2006	21/04/2006	M		
Eastern Great Egret	Ardea modesta		Dalby town	-27.35	151.09	2/07/2003	30/07/2003	M		

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Eastern Great Egret	Ardea modesta		Lake Broadwater NP	-27.35	151.09	11/08/2004	11/08/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.09	18/09/2000	18/09/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.35	151.09	20/09/2001	20/09/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.36	151.09	14/01/1999	14/01/1999	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.36	151.10	5/07/1999	5/07/1999	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.36	151.10	21/09/1999	21/09/1999	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater Inlet	-27.36	151.10	28/11/2008	28/11/2008	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater Inlet	-27.36	151.10	26/11/2007	26/11/2007	M		
Eastern Great Egret	Ardea modesta		L Broadwater CP	-27.36	151.10	20/09/2007	20/09/2007	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	26/10/2004	26/10/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	21/09/2004	21/09/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	10/09/2004	10/09/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	5/07/2004	5/07/2004	M		
Eastern Great Egret	Ardea modesta		Watt Street dam	-27.36	151.10	1/07/2004	1/07/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	4/05/2004	4/05/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Park	-27.36	151.10	23/04/2004	23/04/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	16/04/2004	16/04/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	16/03/2004	16/03/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	8/01/2004	8/01/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	11/12/2003	11/12/2003	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	5/01/2002	5/01/2002	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	21/11/2001	21/11/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	23/10/2001	23/10/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	26/06/2001	26/06/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	11/04/2001	11/04/2001	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	28/09/2000	28/09/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	21/09/2000	21/09/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	22/08/2000	22/08/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater	-27.36	151.10	10/08/2000	26/08/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	27/06/2000	27/06/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	14/06/2000	14/06/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Conservation Park	-27.36	151.10	1/06/2000	29/06/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	17/05/2000	17/05/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Conservation Park	-27.36	151.10	10/05/2000	25/05/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	13/04/2000	13/04/2000	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	22/02/2000	22/02/2000	M		
Eastern Great Egret	Ardea modesta	4	Lake Broadwater Inlet	-27.36	151.10	20/12/1999	20/12/1999	M		
Eastern Great Egret	Ardea modesta	6	Lake Broadwater Inlet	-27.36	151.10	2/12/1999	2/12/1999	M		
Eastern Great Egret	Ardea modesta	5	Lake Broadwater Conservation Park	-27.36	151.10	9/10/1999	9/10/1999	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater Inlet	-27.36	151.10	7/10/1999	7/10/1999	M		
Eastern Great Egret	Ardea modesta	1	Lake Broadwater Inlet	-27.36	151.10	4/09/1999	4/09/1999	M		
Eastern Great Egret	Ardea modesta	2	Lake Broadwater Inlet	-27.36	151.10	4/08/1999	4/08/1999	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	26/07/1999	26/07/1999	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Inlet	-27.36	151.10	14/01/1999	14/01/1999	M		



Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Eastern Great Egret	Ardea modesta		Lake Broadwater CP	-27.37	151.08	15/10/2004	15/10/2004	M		
Eastern Great Egret	Ardea modesta		Lake Broadwater Dam	-27.37	151.08	8/04/2004	8/04/2004	M		
Eastern Great Egret	Ardea modesta		Horse Creek, Leichhardt Hwy	-27.38	150.22	12/11/1999	12/11/1999	M		
Eastern Great Egret	Ardea modesta		The Belahs Prop	-27.38	150.79	25/05/2007	25/05/2007	M		
Eastern Great Egret	Ardea modesta		Rainbow Lagoon	-27.62	150.42	8/07/2000	8/07/2000	M		
Eastern Great Egret	Ardea modesta		Memorial Hall lagoon	-27.84	150.19	17/01/2002	17/01/2002	M		
Bush Stone-curlew	Burhinus grallarius		Yuwandi Old Cameby rd	-26.73	150.25	17/10/2002	18/10/2002			X
Bush Stone-curlew	Burhinus grallarius		Fagans Road Forrest, via Tara	-27.28	150.67	10/11/1998	12/11/1998			X
			Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999			X
Sharp-tailed Sandpiper	Calidris acuminata	4	Belah Water Hole	-26.27	150.00	1/08/1994	1/08/1994	M		
Sharp-tailed Sandpiper	Calidris acuminata		Campbell Park	-26.58	148.84	7/04/2003	8/04/2003	M		
Sharp-tailed Sandpiper	Calidris acuminata		2 sewage ponds	-26.60	148.80	25/10/2004	25/10/2004	M		
Sharp-tailed Sandpiper	Calidris acuminata	16	Roma Sewage Farm	-26.60	148.81	3/11/1999	3/11/1999	M		
Sharp-tailed Sandpiper	Calidris acuminata	2	Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001	M		
Sharp-tailed Sandpiper	Calidris acuminata		Long Swamp grassdale	-27.30	151.03	23/09/2007	23/09/2007	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater	-27.35	151.10	5/10/2002	5/10/2002	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Sharp-tailed Sandpiper	Calidris acuminata	7	Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
Sharp-tailed Sandpiper	Calidris acuminata	31	Lake Broadwater	-27.35	151.10	31/10/1995	31/10/1995	M		
Sharp-tailed Sandpiper	Calidris acuminata	10	Lake Broadwater	-27.35	151.10	24/10/1995	24/10/1995	M		
Sharp-tailed Sandpiper	Calidris acuminata	12	Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater Inlet	-27.36	151.09	17/01/2005	17/01/2005	M		
Sharp-tailed Sandpiper	Calidris acuminata		L Broadwater CP	-27.36	151.10	26/11/2007	26/11/2007	M		
Sharp-tailed Sandpiper	Calidris acuminata		L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
Sharp-tailed Sandpiper	Calidris acuminata		L Broadwater CP	-27.36	151.10	20/09/2007	20/09/2007	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater Inlet	-27.36	151.10	12/02/2005	12/02/2005	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater Park	-27.36	151.10	4/02/2005	4/02/2005	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004	M		
Sharp-tailed Sandpiper	Calidris acuminata		Lake Broadwater	-27.35	151.10	26/09/1995	26/09/1995	M		
Curlew Sandpiper	Calidris ferruginea	2	Lake Broadwater	-27.35	151.10	30/07/1995	30/07/1995	M		
Curlew Sandpiper	Calidris ferruginea	4	Lake Broadwater	-27.35	151.10	30/07/1995	30/07/1995	M		
Glossy Black-Cockatoo	Calyptorhynchus lathami	2 2 km N of Miles		-26.65	150.18	20/05/2006	20/06/2006	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Lake Broadwater Conservation Park	-27.34	151.10	31/01/2001	31/01/2001	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Lake Broadwater	-27.36	151.09	30/08/1998	30/08/1998	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami	4	Stretchworth Forestry	-27.42	151.01	31/03/2005	31/03/2005	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Stretchworth SF	-27.43	151.00	28/03/2000	28/03/2000	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Dunmore Dam	-27.58	151.02	7/03/2000	7/03/2000	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami	3	Moonee Hwy	-27.80	150.25	18/10/2000	18/10/2000	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Burradoo	-27.92	150.63	1/05/1999	30/06/1999	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Bulli Creek	-27.96	150.85	10/07/1999	10/07/1999	V		
Glossy Black-Cockatoo	Calyptorhynchus lathami		Wondul shooting Range	-27.99	151.08	27/08/2002	29/08/2002	V		
White-winged Black Tern	Chlidonias leucopterus	1	Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		X
Speckled Warbler	Chthonicola sagittata		Combabula District Site PG39	-26.34	149.48	30/04/2009	30/04/2009			

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Speckled Warbler	Chthonicola sagittata		Girilmundi	-26.41	150.09	22/04/2000	22/04/2000			X
Speckled Warbler	Chthonicola sagittata		Leichardt Hwy	-26.50	150.10	14/05/2004	31/05/2004			X
Speckled Warbler	Chthonicola sagittata		Horse Creek	-26.55	150.63	3/05/2000	3/05/2000			X
Speckled Warbler	Chthonicola sagittata		Shed, via Miles	-26.55	150.08	1/06/1999	1/06/1999			X
Speckled Warbler	Chthonicola sagittata		Barakula Road	-26.57	150.56	3/05/2000	3/05/2000			X
Speckled Warbler	Chthonicola sagittata		Rest area	-26.62	149.43	3/11/1998	3/11/1998			X
Speckled Warbler	Chthonicola sagittata		Cameby Downs	-26.62	150.34	27/05/2003	2/06/2003			X
Speckled Warbler	Chthonicola sagittata		Rest Area, Old main rd camp & waterhole	-26.62	149.46	15/08/2005	15/08/2005			X
Speckled Warbler	Chthonicola sagittata		Rest Area and Dam	-26.62	149.46	11/04/2007	11/04/2007			X
Speckled Warbler	Chthonicola sagittata		Cameby Downs	-26.62	150.34	10/04/1999	12/04/1999			X
Speckled Warbler	Chthonicola sagittata		Roma - Miles Road	-26.62	149.45	21/05/1999	21/05/1999			X
Speckled Warbler	Chthonicola sagittata		Warrego Hwy	-26.62	149.45	6/07/2001	6/07/2001			X
Speckled Warbler	Chthonicola sagittata		Barakula Road	-26.64	150.60	3/05/2000	3/05/2000			X
Speckled Warbler	Chthonicola sagittata		Warrego H'way near Jackson	-26.64	149.66	10/12/2007	10/12/2007			X
Speckled Warbler	Chthonicola sagittata		B Tennysons Road, via Chinchilla	-26.65	150.58	3/05/2000	3/05/2000			X
Speckled Warbler	Chthonicola sagittata		Paddy Creek, Butlers Road	-26.68	150.15	13/04/2001	13/04/2001			X
Speckled Warbler	Chthonicola sagittata		Warrego Hwy	-26.69	150.48	3/09/2000	3/09/2000			X
Speckled Warbler	Chthonicola sagittata		Maranga	-26.69	151.02	1/01/2003	31/03/2003			X
Speckled Warbler	Chthonicola sagittata		Old Cameby Rd	-26.71	150.31	29/04/2003	29/04/2003			X
Speckled Warbler	Chthonicola sagittata		Chinchilla District Site PG 18	-26.73	150.50	27/04/2009	27/04/2009			X
Speckled Warbler	Chthonicola sagittata		Deadman Gully	-26.78	150.75	18/08/1998	18/08/1998			X
Speckled Warbler	Chthonicola sagittata		Condamine - Kogan Road	-26.88	150.33	25/08/1999	25/08/1999			X
Speckled Warbler	Chthonicola sagittata		Condamine - Kogan Road	-26.90	150.55	22/04/2000	22/04/2000			X
Speckled Warbler	Chthonicola sagittata		Condamine Road	-26.91	149.79	25/05/2000	25/05/2000			X
Speckled Warbler	Chthonicola sagittata		Chinchilla District Site PG 05	-26.91	150.57	25/04/2009	25/04/2009			X
Speckled Warbler	Chthonicola sagittata		Chinchilla District Site PG 19	-26.92	150.56	27/04/2009	27/04/2009			X
Speckled Warbler	Chthonicola sagittata		Wayne's Place Kogan Creek	-26.96	150.75	7/06/2005	8/06/2005			X
Speckled Warbler	Chthonicola sagittata		Condamine SF	-26.96	150.25	20/08/2001	20/08/2001			X
Speckled Warbler	Chthonicola sagittata		Chinchilla District Site PG 09	-26.96	150.52	26/04/2009	26/04/2009			X
Speckled Warbler	Chthonicola sagittata		Chinchilla District Site PG 06	-26.99	150.58	26/04/2009	26/04/2009			X
Speckled Warbler	Chthonicola sagittata		Condamine District Site PG 28	-26.99	150.25	29/04/2009	29/04/2009			X
Speckled Warbler	Chthonicola sagittata		Condamine District Site PG 29	-27.01	150.28	29/04/2009	29/04/2009			X
Speckled Warbler	Chthonicola sagittata		Back Creek	-27.08	150.93	18/08/2006	18/08/2006			X
Speckled Warbler	Chthonicola sagittata		Braemar Power Station	-27.12	150.90	21/06/2007	21/06/2007			X
Speckled Warbler	Chthonicola sagittata		Braemar Forestry	-27.19	150.78	25/01/2005	25/01/2005			X
Speckled Warbler	Chthonicola sagittata		SW Tk, L. Broadwater	-27.32	151.05	5/03/2006	5/03/2006			X
Speckled Warbler	Chthonicola sagittata		4 Bar property, Moonie Hwy, Kumberilla	-27.33	150.93	27/03/2001	27/03/2001			X
Speckled Warbler	Chthonicola sagittata		4 Bar property, Moonie Hwy, Kumberilla	-27.33	150.93	2/12/2000	2/12/2000			X
Speckled Warbler	Chthonicola sagittata		4 Bar property, Moonie Hwy, Kumberilla	-27.33	150.93	15/09/2000	15/09/2000			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater	-27.33	151.10	27/10/2005	31/10/2005			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater	-27.33	151.10	14/03/2000	14/03/2000			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001			X
Speckled Warbler	Chthonicola sagittata		The Gums	-27.34	150.20	16/09/2000	16/09/2000			X
Speckled Warbler	Chthonicola sagittata		The Gums Lagoon	-27.34	150.20	16/09/2000	16/09/2000			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005			X

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Speckled Warbler	Chthonicola sagittata		Lake Broadwater	-27.35	151.09	3/08/2003	3/08/2003			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater	-27.35	151.09	18/09/2000	18/09/2000			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater	-27.35	151.10	17/10/1998	17/10/1998			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004			X
Speckled Warbler	Chthonicola sagittata		Broadwater CP	-27.36	151.10	8/06/2002	8/06/2002			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Conservation Park	-27.36	151.10	10/05/2000	25/05/2000			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Conservation Park	-27.36	151.10	9/10/1999	9/10/1999			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater CP	-27.36	151.10	4/09/1999	4/09/1999			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Dam	-27.37	151.08	6/11/2003	6/11/2003			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Dam	-27.37	151.08	1/07/2001	1/07/2001			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Dam	-27.37	151.08	10/01/2001	10/01/2001			X
Speckled Warbler	Chthonicola sagittata		Lake Broadwater Dam	-27.37	151.08	24/11/2000	24/11/2000			X
Speckled Warbler	Chthonicola sagittata		South west track, Lake Broadwater Conservation Park	-27.37	151.10	6/02/2000	6/02/2000			X
Speckled Warbler	Chthonicola sagittata		Broadwater South	-27.37	151.09	3/04/2005	3/04/2005			X
Speckled Warbler	Chthonicola sagittata		Wilkie Creek	-27.41	150.98	9/06/2002	9/06/2002			X
Speckled Warbler	Chthonicola sagittata		Wilkie Creek	-27.41	150.98	20/01/2000	20/01/2000			X
Speckled Warbler	Chthonicola sagittata		Stretchworth SF	-27.41	151.05	10/06/2001	10/06/2001			X
Speckled Warbler	Chthonicola sagittata		Lily Pool	-27.42	150.95	27/05/2003	27/05/2003			X
Speckled Warbler	Chthonicola sagittata		Stretchworth	-27.42	151.06	20/01/2000	20/01/2000			X
Speckled Warbler	Chthonicola sagittata		Wilkie Creek waterhole	-27.49	150.91	31/05/2005	31/05/2005			X
Speckled Warbler	Chthonicola sagittata		Stretchworth SF	-27.49	151.08	24/07/2001	24/07/2001			X
Speckled Warbler	Chthonicola sagittata		Stretchworth 2	-27.53	151.08	20/01/2000	20/01/2000			X
Speckled Warbler	Chthonicola sagittata		Marmadua	-27.55	150.63	28/08/1998	29/08/1998			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.57	151.05	9/01/2000	9/01/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.58	151.06	7/03/2000	7/03/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.58	151.04	7/03/2000	7/03/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.60	151.07	14/12/1999	19/12/1999			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.61	150.99	7/03/2000	7/03/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.61	150.95	7/03/2000	7/03/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.62	150.99	7/03/2000	7/03/2000			X
Speckled Warbler	Chthonicola sagittata		Dunmore SF	-27.79	151.07	9/01/2000	9/01/2000			X
Speckled Warbler	Chthonicola sagittata		Southwood NP	-27.83	150.10	29/08/2001	30/08/2001			X
Speckled Warbler	Chthonicola sagittata		Southwood NP	-27.83	150.12	20/03/2000	20/03/2000			X
Speckled Warbler	Chthonicola sagittata		Cypress Avenue	-27.98	150.98	10/06/2009	10/06/2009			X
Speckled Warbler	Chthonicola sagittata		Wondul shooting Range	-27.99	151.08	27/08/2002	29/08/2002			X
Speckled Warbler	Chthonicola sagittata		Road 118, Wondul Range	-28.01	151.06	11/11/1999	11/11/1999			X
Brown Treecreeper	Climacteris picumnus		Koorunga Gully, Roma - Taroom Road	-26.17	149.01	24/12/2001	24/12/2001			X
Brown Treecreeper	Climacteris picumnus		Kogan Creek crossing	-27.07	150.75	22/09/2001	22/09/2001			X
Brown Treecreeper	Climacteris picumnus		The Gums Reserve	-27.34	150.20	28/10/1998	28/10/1998			X
Brown Treecreeper	Climacteris picumnus		The Gums Lagoon	-27.34	150.20	16/09/2000	16/09/2000			X
Brown Treecreeper	Climacteris picumnus		Burradoo	-27.92	150.63	1/05/1999	30/06/1999			X
Black-necked Stork	Ephippiorhynchus asiaticus		Taroom	-25.64	149.79	14/08/2004	16/08/2004		R	
Black-necked Stork	Ephippiorhynchus asiaticus		Roma Lower Sewage Works	-26.59	148.80	5/09/1999	5/09/1999		R	
Black-necked Stork	Ephippiorhynchus asiaticus	5	Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001		R	

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Black-necked Stork	Ephippiorhynchus asiaticus	Judd's Lagoon Chinchilla Weir Lake Broadwater inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater CP 2 Lake Broadwater 3 Roma Sewage Works 1 Roma Sewage Ponds 7 Roma Sewage Farm 2 Roma Sewage Works 2 Maranga Sunset Drive reservoir 2 Lagoon Long Swamp Grassdale Lake Broadwater 1 Lake Broadwater 4 Lake Broadwater 3 Lake Broadwater 3 Lake Broadwater Lake Broadwater Inlet Lake Broadwater L Broadwater CP Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Inlet Lake Broadwater Hide Lake Broadwater CP Memorial Hall lagoon Taroom - Injune Road Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara Fagans Road Forrest, via Tara 2 Rest area Goom B1 4 Gavindale Shadeline Cox/Wychie Roads Gavindale Property	-26.64	149.40	21/09/2005	22/09/2005		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-26.80	150.58	11/08/2004	11/08/2004		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-27.36	151.09	15/03/2005	15/03/2005		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-27.36	151.10	21/11/2001	21/11/2001		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-27.36	151.10	25/09/2001	25/09/2001		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-27.36	151.10	30/01/2001	30/01/2001		R		
Black-necked Stork	Ephippiorhynchus asiaticus		-27.36	151.10	4/09/1999	4/09/1999		R		
Latham's Snipe	Gallinago hardwickii		-26.60	148.80	3/11/1999	3/11/1999	M			
Latham's Snipe	Gallinago hardwickii		-26.60	148.81	19/01/2001	19/01/2001	M			
Latham's Snipe	Gallinago hardwickii		-26.60	148.81	3/11/1999	3/11/1999	M			
Latham's Snipe	Gallinago hardwickii		-26.60	148.81	28/10/2000	28/10/2000	M			
Latham's Snipe	Gallinago hardwickii		-26.69	151.02	1/01/2003	31/03/2003	M			
Latham's Snipe	Gallinago hardwickii		-26.76	151.09	31/01/2003	31/01/2003	M			
Latham's Snipe	Gallinago hardwickii		-26.92	149.70	1/04/2004	11/04/2004	M			
Latham's Snipe	Gallinago hardwickii		-27.30	151.03	29/12/2007	29/12/2007	M			
Latham's Snipe	Gallinago hardwickii		-27.35	151.10	1/02/2003	2/02/2003	M			
Latham's Snipe	Gallinago hardwickii		-27.35	151.10	18/04/1996	18/04/1996	M			
Latham's Snipe	Gallinago hardwickii		-27.35	151.10	31/10/1995	31/10/1995	M			
Latham's Snipe	Gallinago hardwickii		-27.35	151.10	7/01/1995	7/01/1995	M			
Latham's Snipe	Gallinago hardwickii		-27.35	151.10	15/10/1994	15/10/1994	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.09	17/01/2005	17/01/2005	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	6/02/2009	6/02/2009	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	26/10/2007	26/10/2007	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	16/03/2004	16/03/2004	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	5/01/2002	5/01/2002	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	6/12/2001	6/12/2001	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	21/11/2001	21/11/2001	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	23/10/2001	23/10/2001	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	28/08/2001	28/08/2001	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	13/04/2000	13/04/2000	M			
Latham's Snipe	Gallinago hardwickii		-27.36	151.10	6/02/2000	6/02/2000	M			
Latham's Snipe	Gallinago hardwickii		-27.37	151.08	15/10/2004	15/10/2004	M			
Latham's Snipe	Gallinago hardwickii		-27.84	150.19	17/01/2002	17/01/2002	M			
Squatter Pigeon	Geophaps scripta		-25.62	149.30			V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	17/02/2000	17/02/2000	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	15/01/2000	15/01/2000	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	15/10/1999	15/10/1999	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	15/07/1999	15/07/1999	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	4/07/1999	4/07/1999	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	16/05/1999	30/05/1999	V	V		
Squatter Pigeon	Geophaps scripta		-27.28	150.67	24/04/1999	26/04/1999	V	V		
Painted Honeyeater	Grantiella picta		-26.62	149.43	3/11/1998	3/11/1998		R		
Painted Honeyeater	Grantiella picta		-26.74	150.42	26/11/2005	26/11/2005		R		
Painted Honeyeater	Grantiella picta		-26.74	150.41	19/10/2003	19/10/2003		R		
Painted Honeyeater	Grantiella picta		-26.75	150.91	23/04/2003	23/04/2003		R		
Painted Honeyeater	Grantiella picta		-26.75	150.42	29/11/2003	29/11/2003		R		

Much of the remaining land is characterised by largely level to gently undulating plains created by weathering of fine-grained sedimentary rocks (Land Zone 9), Cainozoic clay deposits (Land Zone 4), or Cainozoic igneous rocks (Land Zone 8). These geologies give rise to deep texture contrast soils or, more predominantly, black, dark brown and grey-brown cracking clay soils, that are often self mulching and sometimes gilgaied in flatter areas (Land Zone 9), Vertosols with gilgai microrelief (Land Zone 4) and Vertosols, Ferrosols, and shallow Dermosols (Land Zone 8). These highly fertile soils dominate much of the flatter, low-lying landscape and are predominantly cleared for agriculture. Where uncleared, these soils support the remaining patches of threatened communities such as Brigalow *Acacia harpophylla* - Belah *Casuarina cristata* open forest (11.9.5, 11.9.7, 11.9.4b), Poplar Box open forest (11.9.10, 11.4.12) and, rarely, vine thicket (11.9.4a, 11.8.3, and 11.4.3).

The rarest communities within the study area include open-forest to woodland of Dawson Gum *Eucalyptus cambageana* or Mountain Yapunyah *E. thozetiana* and Brigalow (11.9.1) and SEVT on Cainozoic igneous rocks (11.8.3), which cover only seven and eight ha, respectively.

Only 6% of the preclearing extent of Poplar Box woodland with Brigalow and/or Belah on alluvial plains (11.3.17) remains within the Relevant Provinces, which equates to an endangered status at this scale and which is exacerbated by a lack of representation of this community within areas protected under the NC Act. Stands of Gum-topped Box *Eucalyptus moluccana* or Inland Grey Box woodland to open forest on margins of alluvial plains (11.3.26) are also underrepresented (83ha) and unprotected under the NC Act within the Relevant Provinces, reflecting past clearing practices and potentially allowing their ongoing use for grazing and other agricultural pursuits.

The mapping also reflects the dry character of the local landscape, with only 45ha of freshwater wetland communities (11.3.27) currently recognised within the study area.

### **Vegetation Community Status**

Twenty-nine of the REs mapped within the study area have a least concern management status, nine have an of concern management status and nine have an endangered management status under the provisions of the VM Act, based on an assessment of the remaining extent of each RE compared to its preclearing extent. One of the REs (11.5.5) listed as least concern under the VM Act is considered to be at risk of the remnant extent falling below 30% of its preclearing extent, or having a remnant extent of less than 10,000ha, as stated in the Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions (DERM 2009b).

The 'biodiversity status' of an RE is based on an assessment of the condition of remnant vegetation in addition to its preclearing and remnant extent, and takes into account threatening processes other than clearing. As such, it forms the basis of what constitutes an environmentally sensitive area under the EP Act in relation to remnant vegetation.

According to the REDD, three of the REs in Table 2.3 with a least concern management status under the VM Act have an of concern 'biodiversity status', while four of the REs with an of concern management status under the VM Act have an endangered biodiversity status.

Table 2.3 also indicates that 12 of the REs within the study area are analogous to ecological communities listed as endangered under the EPBC Act. However, it should also be noted that, for one of the REs to be considered analogous to an endangered ecological community under the EPBC Act (that is, RE 11.3.2), the listing is subject to the presence of Weeping Myall *Acacia pendula*. Those REs analogous to ecological communities listed as Endangered under the

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Painted Honeyeater	Grantiella picta		Lower Jinghi Back Road	-26.76	151.03	28/03/2001	28/03/2001		R	
Painted Honeyeater	Grantiella picta		Brigalow Patch	-26.76	151.03	13/11/2007	13/11/2007		R	
Painted Honeyeater	Grantiella picta	3	Brigalow + surrounds	-26.76	151.03	5/11/2007	5/11/2007		R	
Painted Honeyeater	Grantiella picta		Inverai Hall and Dam	-26.76	150.95	13/11/2007	13/11/2007		R	
Painted Honeyeater	Grantiella picta		Inverai Hall + Dam	-26.76	150.95	13/10/2007	13/10/2007		R	
Painted Honeyeater	Grantiella picta		Inverai Hall + Dam	-26.76	150.95	12/10/2007	12/10/2007		R	
Painted Honeyeater	Grantiella picta		Jinghi Creek	-26.77	151.05	13/11/2007	13/11/2007		R	
Painted Honeyeater	Grantiella picta		Lower Jinghi Back Road	-26.77	151.05	23/04/2003	23/04/2003		R	
Painted Honeyeater	Grantiella picta		Brigalow Corridor	-26.77	150.93	13/11/2007	13/11/2007		R	
Painted Honeyeater	Grantiella picta		Bird Trail #5 Warra-Canagack Rd	-26.77	150.93	12/11/2007	12/11/2007		R	
Painted Honeyeater	Grantiella picta	4	Brigalow Corridor	-26.77	150.93	5/11/2007	5/11/2007		R	
Painted Honeyeater	Grantiella picta	2	Jandowae bird route site 5	-26.77	150.93	18/10/2007	18/10/2007		R	
Painted Honeyeater	Grantiella picta		Site #5 Road Res Inverai Rd	-26.77	150.93	13/10/2007	13/10/2007		R	
Painted Honeyeater	Grantiella picta	2	Brigalow Corridor	-26.77	150.93	20/09/2007	20/09/2007		R	
Painted Honeyeater	Grantiella picta		Site 5 Jandowae Trail1	-26.77	150.91	18/10/2007	18/10/2007		R	
Painted Honeyeater	Grantiella picta		Wambo Jandowae 1.5	-26.77	150.93	20/10/2007	20/10/2007		R	
Painted Honeyeater	Grantiella picta		Cox Rd, Jandowae	-26.77	150.89	18/10/2007	18/10/2007		R	
Painted Honeyeater	Grantiella picta		Jandowae W	-26.78	151.04	5/10/2003	5/10/2003		R	
Painted Honeyeater	Grantiella picta		Site 6a Jandowae Trail 1	-26.80	150.94	18/10/2007	18/10/2007		R	
Painted Honeyeater	Grantiella picta		Brigalow Corridor	-26.80	150.94	20/09/2007	20/09/2007		R	
Painted Honeyeater	Grantiella picta		Brigalow Corridor	-26.80	150.97	26/09/2007	26/09/2007		R	
Painted Honeyeater	Grantiella picta		Undulla Creek	-27.08	150.08	20/10/2007	20/10/2007		R	
Painted Honeyeater	Grantiella picta		Surat Developmental Road	-27.29	150.35	1/12/2001	1/12/2001		R	
Painted Honeyeater	Grantiella picta		Moonie Town	-27.75	150.42	19/10/2007	19/10/2007		R	
White-bellied Sea-Eagle	Haliaeetus leucogaster		Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Judds Lagoon	-26.64	149.40	12/04/2007	12/04/2007	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		NE of Chinchilla	-26.66	150.85	12/10/2003	12/10/2003	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Chinchilla Weir	-26.80	150.58	14/09/2001	15/09/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Chinchilla Weir	-26.80	150.58	31/10/1999	2/11/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Chinchilla Weir	-26.80	150.58	22/05/2004	23/05/2004	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Chinchilla Weir	-26.80	150.58	12/10/2003	12/10/2003	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Nangram Station	-26.83	150.25	18/09/2000	18/09/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Near Caliguel Waterholes, via Condamine	-26.97	150.13	15/11/1999	15/11/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.33	151.10	14/03/2000	14/03/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		The Gums Lagoon	-27.34	150.20	16/09/2000	16/09/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		The Gums Lagoon	-27.34	150.20	12/08/2000	12/08/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		The Gums	-27.34	150.20	28/09/1999	28/09/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1		-27.35	151.10	13/02/1999	13/02/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	30/10/1996	30/10/1996	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	18/04/1996	18/04/1996	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	10/02/1996	10/02/1996	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	24/10/1995	24/10/1995	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	2	Lake Broadwater	-27.35	151.10	26/09/1995	26/09/1995	M		



Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.10	28/06/1994	28/06/1994	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Picnic	-27.35	151.09	3/04/2005	3/04/2005	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater	-27.35	151.08	5/08/2002	5/08/2002	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.35	151.09	5/03/2009	5/03/2009	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.35	151.09	21/04/2006	21/04/2006	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.35	151.09	18/09/2000	18/09/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.35	151.09	20/08/1999	21/08/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.35	151.10	17/10/1998	17/10/1998	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.36	151.09	13/02/1999	13/02/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater inlet	-27.36	151.09	15/03/2005	15/03/2005	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.36	151.09	4/08/1999	6/08/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	2	Lake Broadwater	-27.36	151.10	6/02/2009	6/02/2009	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	2	L Broadwater Cons Park	-27.36	151.10	28/04/2008	28/04/2008	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		L Broadwater CP	-27.36	151.10	20/09/2007	20/09/2007	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		L Broadwater CP	-27.36	151.10	28/08/2007	28/08/2007	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		L. Broadwater Conservation Park	-27.36	151.10	3/03/2006	3/03/2006	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	10/09/2004	10/09/2004	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Park	-27.36	151.10	23/04/2004	23/04/2004	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	27/01/2004	27/01/2004	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	5/01/2002	5/01/2002	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	6/12/2001	6/12/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Inlet	-27.36	151.10	21/11/2001	21/11/2001	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater	-27.36	151.10	10/08/2000	26/08/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Conservation Park	-27.36	151.10	1/06/2000	29/06/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Conservation Park	-27.36	151.10	10/05/2000	25/05/2000	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster	1	Lake Broadwater Conservation Park	-27.36	151.10	9/10/1999	9/10/1999	M		
White-bellied Sea-Eagle	Haliaeetus leucogaster		Lake Broadwater Dam	-27.37	151.08	8/04/2004	8/04/2004	M		
White-throated Needletail	Hirundapus caudacutus		Cameby Downs	-26.63	150.34	3/01/2005	5/01/2005	M		
White-throated Needletail	Hirundapus caudacutus		Alinga Station, via Chinchilla	-26.67	150.58	29/12/2000	29/12/2000	M		
White-throated Needletail	Hirundapus caudacutus		Maranga	-26.69	151.02	1/01/2003	31/03/2003	M		
White-throated Needletail	Hirundapus caudacutus	6	Warrego Hwy, Chinchilla	-26.73	150.60	23/10/2000	23/10/2000	M		
White-throated Needletail	Hirundapus caudacutus		Goom B1	-26.74	150.42	26/11/2005	26/11/2005	M		
White-throated Needletail	Hirundapus caudacutus		Mooramby Ck	-27.24	150.88	20/11/2004	20/11/2004	M		
White-throated Needletail	Hirundapus caudacutus	4	Bar property, Moonie Hwy, Kumbatilla	-27.33	150.93	2/12/2000	2/12/2000	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.33	151.10	27/10/2005	31/10/2005	M		
White-throated Needletail	Hirundapus caudacutus		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.33	151.10	9/01/1999	10/01/1999	M		
White-throated Needletail	Hirundapus caudacutus	20	4 Bar Property	-27.34	150.93	25/11/2008	25/11/2008	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.35	151.08	21/11/2001	21/11/2001	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater	-27.36	151.09	13/02/1999	13/02/1999	M		
White-throated Needletail	Hirundapus caudacutus		L Broadwater CP	-27.36	151.10	26/11/2007	26/11/2007	M		
White-throated Needletail	Hirundapus caudacutus		L. Broadwater Conservation Park	-27.36	151.10	3/03/2006	3/03/2006	M		

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater Inlet	-27.36	151.10	6/12/2001	6/12/2001	M		
White-throated Needletail	Hirundapus caudacutus		Lake Broadwater Dam	-27.37	151.08	24/11/2000	24/11/2000	M		
White-throated Needletail	Hirundapus caudacutus		South west track, Lake Broadwater							
Black-tailed Godwit	Limosa limosa	6	Conservation Park	-27.37	151.10	6/02/2000	6/02/2000	M		
Square-tailed Kite	Lophoictinia isura		Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999	M		
Square-tailed Kite	Lophoictinia isura		Dunmore SF	-27.60	151.07	14/12/1999	19/12/1999	M		
Square-tailed Kite	Lophoictinia isura		Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
Square-tailed Kite	Lophoictinia isura		Cracow - Bundilla Road	-25.63	149.88	31/12/2000	31/12/2000		R	
Square-tailed Kite	Lophoictinia isura		Braemar Creek	-27.07	150.86	18/08/2006	18/08/2006		R	
Square-tailed Kite	Lophoictinia isura		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001		R	
Square-tailed Kite	Lophoictinia isura		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001		R	
Square-tailed Kite	Lophoictinia isura	2	Lake Broadwater	-27.35	151.08	5/08/2002	5/08/2002		R	
Square-tailed Kite	Lophoictinia isura		Broadwater CP	-27.36	151.10	8/06/2002	8/06/2002		R	
Hooded Robin	Melanodryas cucullata		Kia-Ora Station, via Kogan	-27.08	150.75	9/10/1998	11/10/1998			X
Black-chinned Honeyeater	Melithreptus gularis		Dawson River, Taroom	-25.64	149.79	3/02/2000	3/02/2000		R	
Black-chinned Honeyeater	Melithreptus gularis		Caravan Park	-25.64	149.79	25/09/2004	26/09/2004		R	
Rainbow Bee-eater	Merops ornatus		Taroom - Cracow Road	-25.63	149.90	22/09/2000	22/09/2000	M		
Rainbow Bee-eater	Merops ornatus		Dawson River, Taroom	-25.64	149.79	3/02/2000	3/02/2000	M		
Rainbow Bee-eater	Merops ornatus		Caravan Park	-25.64	149.79	25/09/2004	26/09/2004	M		
Rainbow Bee-eater	Merops ornatus		Taroom Caravan Park	-25.64	149.79	19/10/2000	20/10/2000	M		
Rainbow Bee-eater	Merops ornatus		Taroom Caravan Park	-25.64	149.79	12/10/2000	13/10/2000	M		
Rainbow Bee-eater	Merops ornatus		Taroom/A & D Clarke	-25.65	149.81	27/09/2004	27/09/2004	M		
Rainbow Bee-eater	Merops ornatus		Taroom	-25.65	149.80	15/08/2003	15/08/2003	M		
Rainbow Bee-eater	Merops ornatus		Nathan Road	-25.80	150.09	21/09/2000	21/09/2000	M		
Rainbow Bee-eater	Merops ornatus		Jundah Creek, 'Annabranche'	-25.84	149.83	30/12/2000	30/12/2000	M		
Rainbow Bee-eater	Merops ornatus		'Annabrae'	-25.85	149.84	29/12/2000	30/12/2000	M		
Rainbow Bee-eater	Merops ornatus		Roma - Taroom Road	-25.95	149.42	29/12/2000	29/12/2000	M		
Rainbow Bee-eater	Merops ornatus		Devils Pulpit	-26.03	149.50	27/12/2004	1/01/2005	M		
Rainbow Bee-eater	Merops ornatus		Durham Creek, Roma - Taroom Road	-26.09	149.07	24/12/2001	24/12/2001	M		
Rainbow Bee-eater	Merops ornatus		Bundi Road & Wallumbilla Stock Route junction	-26.11	149.41	29/12/2000	29/12/2000	M		
Rainbow Bee-eater	Merops ornatus		Kooringa Gully, Roma - Taroom Road	-26.17	149.01	24/12/2001	24/12/2001	M		
Rainbow Bee-eater	Merops ornatus		Kowguran Possum Park	-26.51	150.10	15/11/1999	16/11/1999	M		
Rainbow Bee-eater	Merops ornatus		Pickanjinji Ck Hwy 54	-26.58	149.17	2/02/2002	2/02/2002	M		
Rainbow Bee-eater	Merops ornatus	6	Roma Sewage Farm	-26.60	148.81	3/11/1999	3/11/1999	M		
Rainbow Bee-eater	Merops ornatus		Leichhardt Hwy	-26.60	150.16	19/11/1999	19/11/1999	M		
Rainbow Bee-eater	Merops ornatus		Roma Sewage Works 2	-26.60	148.81	20/01/2000	20/01/2000	M		
Rainbow Bee-eater	Merops ornatus		Midgley's Garden	-26.61	150.03	29/09/2007	29/09/2007	M		
Rainbow Bee-eater	Merops ornatus		Cameby Downs	-26.62	150.34	20/09/2002	20/09/2002	M		
Rainbow Bee-eater	Merops ornatus		Cameby Downs	-26.63	150.34	3/01/2005	5/01/2005	M		
Rainbow Bee-eater	Merops ornatus		2 km N of Miles	-26.65	150.18	1/01/2007	4/01/2007	M		
Rainbow Bee-eater	Merops ornatus		RJ Simpson Bridge	-26.66	150.18	11/09/2005	11/09/2005	M		
Rainbow Bee-eater	Merops ornatus		Red Hill Rd	-26.67	150.67	19/09/2007	19/09/2007	M		
Rainbow Bee-eater	Merops ornatus		Mongool Rd	-26.68	149.43	14/10/2007	14/10/2007	M		
Rainbow Bee-eater	Merops ornatus		Maranga	-26.69	151.02	1/01/2003	31/03/2003	M		
Rainbow Bee-eater	Merops ornatus		Dead Man Gully	-26.72	150.78	18/09/2000	19/09/2000	M		

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Rainbow Bee-eater	Merops ornatus	1	Chinchilla	-26.72	150.65	1/04/1999	2/04/1999	M		
Rainbow Bee-eater	Merops ornatus		Sandpit	-26.72	150.60	12/10/1997	12/10/1997	M		
Rainbow Bee-eater	Merops ornatus		Sandpit	-26.72	150.60	13/10/1996	13/10/1996	M		
Rainbow Bee-eater	Merops ornatus		Golf Club Jandowae	-26.72	151.09	4/11/2004	4/11/2004	M		
Rainbow Bee-eater	Merops ornatus		Swamp	-26.73	150.42	25/10/2003	25/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Chinchilla CP	-26.74	150.46	11/10/2003	13/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Charley's Ck	-26.74	150.62	22/09/2004	22/09/2004	M		
Rainbow Bee-eater	Merops ornatus		Goom B1	-26.74	150.42	26/11/2005	26/11/2005	M		
Rainbow Bee-eater	Merops ornatus		Jandowae Dam	-26.76	151.05	5/10/2003	5/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Bimbibi	-26.77	150.48	3/10/1999	3/10/1999	M		
Rainbow Bee-eater	Merops ornatus		Warrego Hwy	-26.78	150.68	25/09/1998	25/09/1998	M		
Rainbow Bee-eater	Merops ornatus		Deadman Gully	-26.78	150.75	18/08/1998	18/08/1998	M		
Rainbow Bee-eater	Merops ornatus		Little hollow, via Chinchilla	-26.80	150.45	2/10/1999	3/10/1999	M		
Rainbow Bee-eater	Merops ornatus		Chinchilla Weir	-26.80	150.58	12/10/2003	12/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Nangram Station	-26.83	150.25	18/09/2000	18/09/2000	M		
Rainbow Bee-eater	Merops ornatus		Warrego Hwy, Brigalow	-26.85	150.80	24/08/1999	24/08/1999	M		
Rainbow Bee-eater	Merops ornatus		Condamine - Kogan Road	-26.89	150.38	20/09/1999	20/09/1999	M		
Rainbow Bee-eater	Merops ornatus		Condamine SF	-26.97	150.30	22/08/2001	22/08/2001	M		
Rainbow Bee-eater	Merops ornatus		Daniels	-26.98	150.66	11/10/2003	11/10/2003	M		
Rainbow Bee-eater	Merops ornatus		State Forest 183	-27.06	150.89	28/09/2004	28/09/2004	M		
Rainbow Bee-eater	Merops ornatus		Braemar Creek	-27.07	150.86	11/10/2003	11/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Kia-Ora Station, via Kogan	-27.08	150.75	9/10/1998	11/10/1998	M		
Rainbow Bee-eater	Merops ornatus	1	Braemar Forestry	-27.19	150.78	25/01/2005	25/01/2005	M		
Rainbow Bee-eater	Merops ornatus		Moramby Ck	-27.24	150.88	7/10/2004	7/10/2004	M		
Rainbow Bee-eater	Merops ornatus		Fagans Road Forrest, via Tara	-27.28	150.67	17/02/2000	17/02/2000	M		
Rainbow Bee-eater	Merops ornatus		Fagans Road Forrest, via Tara	-27.28	150.67	14/09/1999	14/09/1999	M		
Rainbow Bee-eater	Merops ornatus		Fagans Road Forrest, via Tara	-27.28	150.67	8/03/1999	12/03/1999	M		
Rainbow Bee-eater	Merops ornatus		Fagans Road Forrest, via Tara	-27.28	150.67	9/01/1999	12/01/1999	M		
Rainbow Bee-eater	Merops ornatus		'4 Bar' property	-27.32	150.92	26/11/1999	26/11/1999	M		
Rainbow Bee-eater	Merops ornatus		4 Bar Property	-27.33	150.93	19/03/2004	19/03/2004	M		
Rainbow Bee-eater	Merops ornatus		4 bar Property	-27.33	150.93	25/11/2003	25/11/2003	M		
Rainbow Bee-eater	Merops ornatus		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	16/10/2001	16/10/2001	M		
Rainbow Bee-eater	Merops ornatus		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	2/12/2000	2/12/2000	M		
Rainbow Bee-eater	Merops ornatus		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	15/09/2000	15/09/2000	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.33	151.10	27/10/2005	31/10/2005	M		
Rainbow Bee-eater	Merops ornatus		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.33	151.10	14/03/2000	14/03/2000	M		
Rainbow Bee-eater	Merops ornatus		Fitzgibbon Bushland	-27.34	151.03	27/12/2007	27/12/2007	M		
Rainbow Bee-eater	Merops ornatus		4 Bar property	-27.34	150.93	2/12/2007	2/12/2007	M		
Rainbow Bee-eater	Merops ornatus		4 Barr Property	-27.34	150.93	15/09/2006	15/09/2006	M		
Rainbow Bee-eater	Merops ornatus		The Gums Reserve	-27.34	150.20	28/10/1998	28/10/1998	M		
Rainbow Bee-eater	Merops ornatus		The Gums Reserve	-27.34	150.19	11/03/1999	13/03/1999	M		
Rainbow Bee-eater	Merops ornatus		The Gums	-27.34	150.20	16/09/2000	16/09/2000	M		
Rainbow Bee-eater	Merops ornatus		The Gums Lagoon	-27.34	150.20	16/09/2000	16/09/2000	M		
Rainbow Bee-eater	Merops ornatus		The Gums Lagoon	-27.34	150.20	12/08/2000	12/08/2000	M		
Rainbow Bee-eater	Merops ornatus		The Gums	-27.34	150.20	28/09/1999	28/09/1999	M		

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Rainbow Bee-eater	Merops ornatus	10	The Gums Lagoon	-27.34	150.20	22/09/2001	22/09/2001	M		
Rainbow Bee-eater	Merops ornatus		Wilga Tk, L. Broadwater	-27.35	151.09	9/01/2007	9/01/2007	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.35	151.10	26/10/1999	26/10/1999	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Picnic	-27.35	151.09	3/04/2005	3/04/2005	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
Rainbow Bee-eater	Merops ornatus		Broadwater Park	-27.35	151.09	28/10/2003	28/10/2003	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.35	151.09	18/09/2000	18/09/2000	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.35	151.10	17/10/1998	17/10/1998	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.36	151.09	22/02/2005	22/02/2005	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.36	151.10	6/02/2009	6/02/2009	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater	-27.36	151.10	27/12/2008	27/12/2008	M		
Rainbow Bee-eater	Merops ornatus		10 Lake Broadwater Inlet	-27.36	151.10	28/11/2008	28/11/2008	M		
Rainbow Bee-eater	Merops ornatus		L Broader CP	-27.36	151.10	26/11/2007	26/11/2007	M		
Rainbow Bee-eater	Merops ornatus		L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
Rainbow Bee-eater	Merops ornatus		L Broadwater CP	-27.36	151.10	20/09/2007	20/09/2007	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Park	-27.36	151.10	4/02/2005	4/02/2005	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Inlet	-27.36	151.10	6/02/2004	6/02/2004	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Inlet	-27.36	151.10	18/12/2003	18/12/2003	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Conservation Park	-27.36	151.10	9/10/1999	9/10/1999	M		
Rainbow Bee-eater	Merops ornatus	10	Lake Broadwater CP	-27.36	151.10	4/09/1999	4/09/1999	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater CP	-27.37	151.08	15/10/2004	15/10/2004	M		
Rainbow Bee-eater	Merops ornatus		Lake Broadwater Dam	-27.37	151.08	21/11/2001	21/11/2001	M		
Rainbow Bee-eater	Merops ornatus		Circuit Walk, L. Broadwater	-27.37	151.10	5/10/2002	5/10/2002	M		
Rainbow Bee-eater	Merops ornatus		Stretchworth SF gate	-27.42	151.08	28/03/2000	28/03/2000	M		
Rainbow Bee-eater	Merops ornatus		Stretchworth SF	-27.43	151.00	28/03/2000	28/03/2000	M		
Rainbow Bee-eater	Merops ornatus		Wilkie Creek, Stretchworth SF	-27.43	150.93	28/03/2000	28/03/2000	M		
Rainbow Bee-eater	Merops ornatus		Wilkie Creek	-27.51	150.92	31/03/2005	31/03/2005	M		
Rainbow Bee-eater	Merops ornatus		Marmadura Forest	-27.53	150.50	14/09/1999	15/09/1999	M		
Rainbow Bee-eater	Merops ornatus		Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999	M		
Rainbow Bee-eater	Merops ornatus		Dunmore Dam	-27.58	151.02	7/03/2000	7/03/2000	M		
Rainbow Bee-eater	Merops ornatus		Dunmore SF	-27.60	151.07	14/12/1999	19/12/1999	M		
Rainbow Bee-eater	Merops ornatus		Moonie River Bridge, Leichhardt Hwy	-27.62	150.29	12/11/1999	12/11/1999	M		
Rainbow Bee-eater	Merops ornatus		Moonie CP	-27.72	150.37	7/11/2008	8/11/2008	M		
Rainbow Bee-eater	Merops ornatus		Moonie Town	-27.75	150.42	19/10/2007	19/10/2007	M		
Rainbow Bee-eater	Merops ornatus		Warrawa Station 8, Moonie Hwy	-27.84	150.15	17/10/2000	19/10/2000	M		
Rainbow Bee-eater	Merops ornatus		Warrawa Homestead, Moonie Hwy	-27.85	150.15	16/10/2000	19/10/2000	M		
Rainbow Bee-eater	Merops ornatus			-27.90	150.35	16/10/1998	16/10/1998	M		
Rainbow Bee-eater	Merops ornatus		20km SW of Millmerran	-27.97	150.99	26/03/1999	26/03/1999	M		
Rainbow Bee-eater	Merops ornatus	10	Scrubby Creek, Goondiwindi - Millerman Road	-27.97	150.98	20/09/1999	20/09/1999	M		
Satin Flycatcher	Myiagra cyanoleuca		Fagans Road Forrest, via Tara	-27.28	150.67	15/01/2000	15/01/2000	M		
Satin Flycatcher	Myiagra cyanoleuca		Fagans Road Forrest, via Tara	-27.28	150.67	8/01/2000	8/01/2000	M		
Turquoise Parrot	Neophema pulchella		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001		R	

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Turquoise Parrot	Neophema pulchella	1	Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001		R	
Turquoise Parrot	Neophema pulchella		Marmadua	-27.55	150.63	28/08/1998	29/08/1998		R	
Turquoise Parrot	Neophema pulchella	2	Southwood NP	-27.83	150.17	9/08/1998	9/08/1998		R	
Cotton Pygmy-goose	Nettapus coromandelianus	1		-26.01	149.35	13/04/2006	13/04/2006		R	
Cotton Pygmy-goose	Nettapus coromandelianus	2	Roma Sewage Ponds	-26.60	148.81	6/01/2000	6/01/2000		R	
Cotton Pygmy-goose	Nettapus coromandelianus		Lake Broadwater	-27.35	151.10	30/10/1996	30/10/1996		R	
Cotton Pygmy-goose	Nettapus coromandelianus	5	Lake Broadwater	-27.35	151.10	25/02/1995	25/02/1995		R	
Cotton Pygmy-goose	Nettapus coromandelianus	3	Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995		R	
Cotton Pygmy-goose	Nettapus coromandelianus	2	Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005		R	
Cotton Pygmy-goose	Nettapus coromandelianus		Lake Broadwater	-27.36	151.09	14/01/1999	14/01/1999		R	
Cotton Pygmy-goose	Nettapus coromandelianus	2	Lake Broadwater Park	-27.36	151.10	23/04/2004	23/04/2004		R	
Cotton Pygmy-goose	Nettapus coromandelianus		Lake Broadwater Inlet	-27.36	151.10	27/01/2004	27/01/2004		R	
Cotton Pygmy-goose	Nettapus coromandelianus	2	Lake Broadwater Inlet	-27.36	151.10	8/01/2004	8/01/2004		R	
Cotton Pygmy-goose	Nettapus coromandelianus		Lake Broadwater Inlet	-27.36	151.10	14/01/1999	14/01/1999		R	
Cotton Pygmy-goose	Nettapus coromandelianus	2	Memorial Hall lagoon	-27.84	150.19	17/01/2002	17/01/2002		R	
Cotton Pygmy-goose	Nettapus coromandelianus		Beilba NP Hut	-25.58	148.91	28/04/2001	10/05/2001			X
Barking Owl	Ninox connivens	1	Fagans Road Forrest, via Tara	-27.28	150.67	10/11/1998	12/11/1998			X
Barking Owl	Ninox connivens		Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999			X
Glossy Ibis	Plegadis falcinellus	4	Waikola	-26.03	149.25	25/12/2004	1/01/2005	M		
Glossy Ibis	Plegadis falcinellus	3	Sewage treatment works	-26.60	148.80	23/05/2004	23/05/2004	M		
Glossy Ibis	Plegadis falcinellus		Roma Sewage Ponds	-26.60	148.81	28/10/2000	28/10/2000	M		
Glossy Ibis	Plegadis falcinellus	3	Brigalow Corridor	-26.77	150.93	6/12/2007	6/12/2007	M		
Glossy Ibis	Plegadis falcinellus		Long Swamp Grassdale	-27.30	151.03	29/12/2007	29/12/2007	M		
Glossy Ibis	Plegadis falcinellus	3	Long Swamp Grassdale	-27.30	151.03	23/09/2007	23/09/2007	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003	M		
Glossy Ibis	Plegadis falcinellus	11	Lake Broadwater	-27.35	151.10	26/09/1995	26/09/1995	M		
Glossy Ibis	Plegadis falcinellus	5	Lake Broadwater	-27.35	151.10	30/07/1995	30/07/1995	M		
Glossy Ibis	Plegadis falcinellus	5	Lake Broadwater	-27.35	151.10	13/05/1995	13/05/1995	M		
Glossy Ibis	Plegadis falcinellus	3	Lake Broadwater	-27.35	151.10	30/03/1995	30/03/1995	M		
Glossy Ibis	Plegadis falcinellus	22	Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995	M		
Glossy Ibis	Plegadis falcinellus	5	Lake Broadwater	-27.35	151.10	15/10/1994	15/10/1994	M		
Glossy Ibis	Plegadis falcinellus	4	Lake Broadwater	-27.35	151.09	6/01/2003	19/01/2003	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater	-27.36	151.09	14/01/1999	14/01/1999	M		
Glossy Ibis	Plegadis falcinellus	4	Lake Broadwater	-27.36	151.10	6/02/2009	6/02/2009	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater	-27.36	151.10	27/12/2008	27/12/2008	M		
Glossy Ibis	Plegadis falcinellus	2	L Broadwater Con Park	-27.36	151.10	2/05/2008	2/05/2008	M		
Glossy Ibis	Plegadis falcinellus		L Broadwater Cons Park	-27.36	151.10	28/04/2008	28/04/2008	M		
Glossy Ibis	Plegadis falcinellus	30	L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
Glossy Ibis	Plegadis falcinellus	30	Lake Broadwater Inlet	-27.36	151.10	26/10/2004	26/10/2004	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004	M		
Glossy Ibis	Plegadis falcinellus	30	Lake Broadwater Inlet	-27.36	151.10	21/09/2004	21/09/2004	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater Inlet	-27.36	151.10	10/09/2004	10/09/2004	M		
Glossy Ibis	Plegadis falcinellus	30	Lake Broadwater Inlet	-27.36	151.10	23/10/2001	23/10/2001	M		
Glossy Ibis	Plegadis falcinellus		Lake Broadwater Inlet	-27.36	151.10	26/06/2001	26/06/2001	M		
Glossy Ibis	Plegadis falcinellus	30	Lake Broadwater Inlet	-27.36	151.10	14/01/1999	14/01/1999	M		
Glossy Ibis	Plegadis falcinellus		Memorial Hall lagoon	-27.84	150.19	17/01/2002	17/01/2002	M		

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Glossy Ibis	Plegadis falcinellus		Burradoo	-27.92	150.63	1/05/1999	30/06/1999	M		
White-browed Babbler	Pomatostomus superciliosus		Campbell Park	-26.58	148.84	7/04/2003	8/04/2003			X
White-browed Babbler	Pomatostomus superciliosus		Yuleba SF	-26.62	149.46	7/12/1999	7/12/1999			X
White-browed Babbler	Pomatostomus superciliosus		McCaskers Road	-27.08	150.22	23/04/2000	23/04/2000			X
White-browed Babbler	Pomatostomus superciliosus		Southwood NP	-27.83	150.12	20/03/2000	20/03/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Beliba NP Hut	-25.58	148.91	28/04/2001	10/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Dunoon Property	-25.60	149.52	1/01/2005	2/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Dawson River	-25.60	149.91	26/07/2003	26/07/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Taroom Park	-25.64	149.80	15/09/2007	15/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Taroom Caravan Park	-25.64	149.79	19/10/2000	20/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Taroom - Roma Road	-25.81	149.56					X
Grey-crowned Babbler	Pomatostomus temporalis		Leichhardt Hwy	-25.82	149.90	3/09/2003	3/09/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		'Annabranch'	-25.84	149.77	30/12/2000	30/12/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Devils Pulpit	-26.03	149.50	27/12/2004	1/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Waikola	-26.03	149.25	25/12/2004	1/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis			-26.11	150.06	22/09/1998	22/09/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Wandoan Environment Park	-26.12	149.96	17/08/2004	17/08/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Cherwondah property	-26.19	149.92	8/07/1999	8/07/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Cherwondah	-26.20	149.93	8/07/1999	8/07/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Wolebee Road	-26.35	149.87	23/04/2000	23/04/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Wandoan District Site PG44	-26.35	149.75	30/04/2009	30/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Roma - Taroom Road	-26.35	148.85	29/04/2001	29/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Gurilmundi	-26.40	150.07	19/08/2005	20/08/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Mooga Mooga Creek	-26.42	148.80	28/06/2001	28/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Possum Park	-26.50	150.10	24/05/2003	26/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Kowguran	-26.50	150.10	17/06/2007	17/06/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Possum Park Kowguran	-26.50	150.10	8/09/2005	12/09/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Rail Crossing Track	-26.50	150.12	26/05/2003	26/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Kowguran	-26.50	150.10	18/04/2007	25/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Possum Park, Kowguran	-26.51	150.10	21/04/2000	24/04/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Kowguran Possum Park	-26.51	150.10	15/11/1999	16/11/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Columboola country	-26.55	150.33	13/05/2007	14/05/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Shed, via Miles	-26.55	150.08	1/06/1999	1/06/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Campbell Park	-26.58	148.84	3/09/2005	3/09/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrego Hwy	-26.58	148.84	12/06/2001	12/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrego Hwy, Wallumbilla	-26.59	149.17	4/04/2001	4/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Sewage ponds	-26.60	148.80	11/05/2006	11/05/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		Leichhardt Hwy	-26.60	150.16	19/11/1999	19/11/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		'Donmorandi'	-26.61	150.78	4/04/1999	5/04/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Yuleba Creek, Warrego Hwy	-26.61	149.39	17/07/2001	17/07/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrego Hwy picnic area, Yuleba	-26.61	149.39	5/07/2000	5/07/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Yuleba	-26.61	149.39	19/06/2001	19/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Cameby Downs	-26.62	150.34	29/12/1998	29/12/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Cameby Downs	-26.62	150.34	27/05/2003	2/06/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Cameby Downs	-26.62	150.34	20/09/2002	20/09/2002			X
Grey-crowned Babbler	Pomatostomus temporalis		Rest Area	-26.62	149.96	21/07/2007	21/07/2007			X



Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis	13	Ironbark site between Roma and Miles	-26.62	149.43	10/08/2001	10/08/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Rest Aress & Waterhole	-26.62	149.46	12/11/2007	12/11/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Rest Area and Dam	-26.62	149.46	11/04/2007	11/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Cameby Downs	-26.62	150.34	10/04/1999	12/04/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Roma - Miles Road	-26.62	149.45	21/05/1999	21/05/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Roadside Warrego Hwy State Forest	-26.62	149.51	12/11/2007	12/11/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Cameby Downs	-26.63	150.34	3/01/2005	5/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Barraluth Rd	-26.63	150.58	18/08/2005	18/08/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Judd's Lagoon	-26.64	149.40	19/03/2008	20/03/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Judds Lagoon	-26.64	149.40	12/04/2007	12/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Judds Lagoon	-26.64	149.40	23/09/2003	23/09/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Barakula Road	-26.64	150.60	3/05/2000	3/05/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrego Hwy, Drillham	-26.64	149.98	4/04/2001	4/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Overflow Caravan Park	-26.64	150.70	3/04/2001	3/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrego Hwy	-26.64	150.00	12/09/2000	12/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Dulacca Creek	-26.64	149.78	30/07/2006	30/07/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		2 km N of Miles	-26.65	150.18	6/12/2007	15/01/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		2 km N of Miles	-26.65	150.18	1/01/2007	4/01/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Rocky Creek, Barakula Road	-26.66	150.58	3/05/2000	3/05/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Avon Downs	-26.66	150.34	31/10/2005	21/11/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Miles	-26.66	150.18	1/09/1999	1/09/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Red Hill Rd	-26.67	150.67	19/09/2007	19/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Dulacca	-26.67	149.75	19/08/1998	19/08/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Engine Road (2)	-26.67	150.57	1/05/2003	1/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		G&G Richmond Downs Pasture	-26.68	148.87	20/04/2007	20/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Old Man Lagoon	-26.68	150.70	26/11/2000	27/11/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Mongool Rd	-26.68	149.43	14/10/2007	14/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Engine Road	-26.69	150.56	1/05/2003	1/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Maranga	-26.69	151.02	1/01/2003	31/03/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Jinghi Creek	-26.70	151.08	26/05/2006	26/05/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla	-26.72	150.65	1/04/1999	2/04/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Callitris	-26.72	150.60	26/07/1998	26/07/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Sandpit	-26.72	150.60	17/01/1998	17/01/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla District Site PG 18	-26.73	150.50	27/04/2009	27/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla	-26.73	150.58	2/10/1999	2/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Col and Gloria Rodgers Rd	-26.74	150.64	10/04/2007	10/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Gavindale Shadeline	-26.74	150.41	19/10/2003	19/10/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Gavindale	-26.75	150.42	29/04/2003	29/04/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Boshammer Walk, Chinchilla	-26.75	150.64	20/03/1999	20/03/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Miles Township	-26.75	150.25	20/10/2007	20/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Lower Jinghi Back Road	-26.76	151.03	28/03/2001	28/03/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Brigalow Patch	-26.76	151.03	20/09/2007	20/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		A Creek	-26.77	151.05	3/09/2002	3/09/2002			X
Grey-crowned Babbler	Pomatostomus temporalis		Lower Jinghi Back Road	-26.77	151.05	23/04/2003	23/04/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Brigalow Corridor	-26.77	150.93	6/12/2007	6/12/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Brigalow Corridor	-26.77	150.93	13/11/2007	13/11/2007			X

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis	3	Jandowae bird route site 5	-26.77	150.93	18/10/2007	18/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Site 5 Jandowae Trail1	-26.77	150.91	18/10/2007	18/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Wambo Jandowae 1.5	-26.77	150.93	20/10/2007	20/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Bimbimbi	-26.77	150.48	3/10/1999	3/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Bimbimbi Dam	-26.77	150.47	13/10/2007	13/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Jingi Jingi Creek	-26.78	151.03	7/05/1999	7/05/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Deadman Gully	-26.78	150.75	18/08/1998	18/08/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Little hollow, via Chinchilla	-26.80	150.45	2/10/1999	3/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla weir	-26.80	150.58	6/05/2009	7/05/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine River	-26.80	150.68	20/10/2001	20/10/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine River	-26.80	150.68	17/09/2001	17/09/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla Weir	-26.80	150.58	31/10/1999	2/11/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla Weir	-26.80	150.58	22/05/2004	23/05/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Weir	-26.80	150.58	11/05/2006	12/05/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla Weir	-26.80	150.58	27/04/2003	27/04/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla West picnic area	-26.80	150.58	3/04/2001	3/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla Weir	-26.80	150.58	13/08/2005	15/08/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Chinchilla Weir	-26.81	150.58	18/10/2003	18/10/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine River, Boonarga	-26.81	150.69	10/04/1999	10/04/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Chincilla Weir	-26.83	150.42	16/04/2002	17/04/2002			X
Grey-crowned Babbler	Pomatostomus temporalis		Nangram Station	-26.83	150.25	18/09/2000	18/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine River, Banana Bridge	-26.85	150.77	17/09/2001	17/09/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Camaron Hwy	-26.86	148.97	17/09/2000	17/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine District Site PG32	-26.88	150.24	29/04/2009	29/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine - Kogan Road	-26.89	150.38	20/09/1999	20/09/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine-Miles Dist Site PG04	-26.90	150.39	25/04/2009	25/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Surat - Condamine Road	-26.92	149.98	14/07/2001	14/07/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Lagoon	-26.92	149.70	11/04/2004	11/04/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine District Site PG 21	-26.93	150.24	27/04/2009	27/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine	-26.93	150.13	24/04/2000	24/04/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Wayne's Place Kogan Creek	-26.96	150.75	7/06/2005	8/06/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Tchanning Creek Yuelba State Forest	-26.96	149.74	9/04/2004	12/04/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Daniels	-26.98	150.66	11/10/2003	11/10/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Condamine District Site PG 29	-27.01	150.28	29/04/2009	29/04/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Kia Ora property	-27.03	150.70	28/08/1999	28/08/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrabeelbee Rd	-27.05	150.84	17/01/2007	17/01/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		State Forest 183	-27.06	150.89	28/09/2004	28/09/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Braemar Creek, Kogan Road	-27.07	150.87	20/10/2001	20/10/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Kogan Creek crossing	-27.07	150.75	22/09/2001	22/09/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Kia-Ora Station, via Kogan	-27.08	150.75	9/10/1998	11/10/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Upper Humbug Creek Road	-27.09	150.38	22/04/2000	22/04/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		McCaskers Road	-27.09	150.28	22/04/2000	22/04/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Kia-Ora	-27.10	150.76	30/10/2004	30/10/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Braemar Power Station	-27.12	150.90	21/06/2007	21/06/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Waterhole Kubarilla Rd	-27.14	150.95	12/09/2007	12/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Warwick Golf Course	-27.18	151.02	26/02/2001	26/02/2001			X

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis	6	Millers easement	-27.21	151.01	12/09/2007	12/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Ck, Ducklo	-27.24	151.02	7/10/2004	7/10/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Ck, Ducklo	-27.24	151.02	21/09/2004	21/09/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Willie Creek Duck LO	-27.24	151.02	12/09/2007	12/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Moramby Creek	-27.24	150.88	12/09/2007	12/09/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Weir	-27.27	150.46	13/08/2003	13/08/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	17/02/2000	17/02/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	15/01/2000	15/01/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	18/10/1999	18/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	15/10/1999	15/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	14/09/1999	14/09/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	15/07/1999	15/07/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	17/06/1999	17/06/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Fagans Road Forrest, via Tara	-27.28	150.67	10/11/1998	12/11/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Tara	-27.28	150.47	16/09/2000	17/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		'4 Bar' property	-27.32	150.92	26/11/1999	26/11/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Corowa II, Kumbarella	-27.32	150.88	20/06/2003	20/06/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Moonie Hwy	-27.33	150.91	24/06/2000	24/06/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar Property	-27.33	150.93	19/03/2004	19/03/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property	-27.33	150.93	12/07/2003	12/07/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	27/03/2001	27/03/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	21/12/2000	21/12/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	15/09/2000	15/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property, Moonie Hwy, Kumbarella	-27.33	150.93	30/06/2000	30/06/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.33	151.10	27/10/2005	31/10/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.33	151.10	14/03/2000	14/03/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.33	151.10	9/01/1999	10/01/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.34	151.10	17/10/2008	19/10/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Conservation Park	-27.34	151.10	8/06/2001	11/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Caravan Park	-27.34	151.10	8/06/2001	11/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property	-27.34	150.88	11/12/2004	11/12/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar Property	-27.34	150.93	25/11/2008	25/11/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar property	-27.34	150.93	21/12/2007	21/12/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		4 Bar Property	-27.34	150.93	25/05/2007	25/05/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilga Tk, L. Broadwater	-27.35	151.09	9/01/2007	9/01/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Picnic	-27.35	151.09	3/04/2005	3/04/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.08	28/02/2003	28/02/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilga Camp track	-27.35	151.08	31/07/2002	31/07/2002			X
Grey-crowned Babbler	Pomatostomus temporalis		Broadwater Park	-27.35	151.09	28/10/2003	28/10/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.09	3/08/2003	3/08/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lakeview	-27.35	151.09	22/07/2003	22/07/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		L Broadwater CP	-27.35	151.09	15/04/2005	15/04/2005			X

EPBC Act are indicated on Figure 2.5 and on the final map set in Appendix F.

Table 2.4 provides a summary of the current extent of each of the REs within the Relevant Provinces, within areas protected under the NC Act and within the study area. Local variations in landscape typology and land-use practices may lead to disproportionate losses of some REs within a given region. That is, REs not under threat from clearing in one province may be threatened within another and may therefore require a higher degree of protection than would otherwise be indicated. For this reason, the extent of REs remaining within areas protected under the NC Act and within the study area have been expressed as percentages of that within the Relevant Provinces. This comparison highlights those REs under most threat from disturbance within the study area.

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater	-27.35	151.09	18/09/2000	18/09/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.09	20/08/1999	21/08/1999			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater	-27.35	151.09	18/08/2008	18/08/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.35	151.10	17/10/1998	17/10/1998			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater inlet	-27.36	151.09	15/03/2005	15/03/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.36	151.09	22/02/2005	22/02/2005			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.09	17/01/2005	17/01/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.36	151.09	4/08/1999	6/08/1999			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater birdhide	-27.36	151.10	31/08/2005	31/08/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.36	151.10	20/09/2001	20/09/2001			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater	-27.36	151.10	6/02/2009	6/02/2009			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.36	151.10	27/12/2008	27/12/2008			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	28/11/2008	28/11/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Garden Near Broadwater	-27.36	151.10	16/07/2008	16/07/2008			X
Grey-crowned Babbler	Pomatostomus temporalis	6	L Broadwater Con Park	-27.36	151.10	2/05/2008	2/05/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		L Broader CP	-27.36	151.10	26/11/2007	26/11/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	6	L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		L Broadwater CP	-27.36	151.10	28/08/2007	28/08/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	6	L Broadwater Inlet	-27.36	151.10	7/05/2007	7/05/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	18/04/2007	18/04/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	29/01/2007	29/01/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		L. Broadwater Conservation Park	-27.36	151.10	3/03/2006	3/03/2006			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater	-27.36	151.10	17/06/2005	17/06/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater CP	-27.36	151.10	10/06/2005	10/06/2005			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater CP	-27.36	151.10	8/04/2005	8/04/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	28/02/2005	28/02/2005			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Park	-27.36	151.10	4/02/2005	4/02/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	25/09/2004	25/09/2004			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	21/09/2004	21/09/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	10/09/2004	10/09/2004			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	4/05/2004	4/05/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Park	-27.36	151.10	23/04/2004	23/04/2004			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	16/04/2004	16/04/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	27/01/2004	27/01/2004			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	8/01/2004	8/01/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	18/12/2003	18/12/2003			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	11/12/2003	11/12/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Broadwater CP	-27.36	151.10	8/06/2002	8/06/2002			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	23/10/2001	23/10/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Inlet	-27.36	151.10	26/06/2001	26/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Inlet	-27.36	151.10	1/03/2001	1/03/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater	-27.36	151.10	10/08/2000	26/08/2000			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Conservation Park	-27.36	151.10	1/06/2000	29/06/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Conservation Park	-27.36	151.10	10/05/2000	25/05/2000			X
Grey-crowned Babbler	Pomatostomus temporalis	6	Lake Broadwater Conservation Park	-27.36	151.10	9/10/1999	9/10/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater CP	-27.36	151.10	4/09/1999	4/09/1999			X

Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis		Broadwater C.P.	-27.36	151.10	2/09/2006	2/09/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		Stretchworth	-27.37	151.02	14/08/2003	14/08/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Dam	-27.37	151.08	6/01/2008	6/01/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater CP	-27.37	151.08	15/10/2004	15/10/2004			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Dam	-27.37	151.08	6/11/2003	6/11/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Dam	-27.37	151.08	27/09/2001	27/09/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Lake Broadwater Dam	-27.37	151.08	24/11/2000	24/11/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Broadwater South	-27.37	151.09	3/04/2005	3/04/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		The Belahs Prop	-27.38	150.79	25/05/2007	25/05/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Stretchworth SF	-27.40	150.98	24/07/2001	24/07/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Creek, Stretchworth SF	-27.41	150.98	28/03/2000	28/03/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Creek	-27.41	150.98	20/01/2000	20/01/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Stretchworth SF	-27.41	151.05	10/06/2001	10/06/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Planted native trees	-27.42	151.08	13/04/1998	13/04/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		E. pilligaensis	-27.42	151.08	13/04/1998	13/04/1998			X
Grey-crowned Babbler	Pomatostomus temporalis		Brigalow	-27.42	151.08	18/09/1997	18/09/1997			X
Grey-crowned Babbler	Pomatostomus temporalis		Planted native trees	-27.42	151.08	8/01/1996	8/01/1996			X
Grey-crowned Babbler	Pomatostomus temporalis		Stretchworth Forestry	-27.42	151.01	31/03/2005	31/03/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		'Duntroon'	-27.42	151.08	20/01/2000	20/01/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Creek waterhole	-27.49	150.91	31/05/2005	31/05/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Stitchworth SF	-27.50	151.03	18/10/2008	18/10/2008			X
Grey-crowned Babbler	Pomatostomus temporalis		Wilkie Creek	-27.51	150.92	31/03/2005	31/03/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Burnett Waterhole	-27.51	150.92	27/05/2003	27/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Cecil Plains Golf Course	-27.53	151.02	12/05/2001	12/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Dunmore SF	-27.55	150.95	13/12/1999	18/12/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Dunmore SF	-27.60	151.07	14/12/1999	19/12/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Dunmore SF	-27.61	150.99	7/03/2000	7/03/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Cattle Creek	-27.61	150.67	7/08/2000	7/08/2000			X
Grey-crowned Babbler	Pomatostomus temporalis	6 G & G, CC1		-27.68	150.54	7/12/2007	7/12/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	12 GNGCC 2		-27.68	150.54	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		G & G, Crowder Ck 02	-27.68	150.54	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		G & G, Crowder Ck 02	-27.68	150.54	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	12 GNGCC 2		-27.68	150.54	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	12 GNGCC2		-27.68	150.54	20/10/2006	20/10/2006			X
Grey-crowned Babbler	Pomatostomus temporalis	3 GNGCC2		-27.68	150.54	20/10/2006	20/10/2006			X
Grey-crowned Babbler	Pomatostomus temporalis		G & G CC6	-27.76	150.28	20/10/2006	20/10/2006			X
Grey-crowned Babbler	Pomatostomus temporalis	7 GNGGA5		-27.76	150.28	7/12/2007	7/12/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	7 GNGGA 5		-27.76	150.28	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis	4 G & G, Crowder Ck 05		-27.76	150.28	16/03/2007	16/03/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Homestead, Moonie Hwy	-27.85	150.15	16/10/2000	19/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 1, Moonie Hwy	-27.85	150.16	22/05/2001	22/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 1, Moonie Hwy	-27.85	150.16	18/10/2000	18/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 3, Moonie Hwy	-27.87	150.16	22/05/2001	22/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 3, Moonie Hwy	-27.87	150.16	18/10/2000	18/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 4, Moonie Hwy	-27.87	150.17	22/05/2001	22/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warrawa Station 6	-27.88	150.19	22/05/2001	22/05/2001			X



Common Name	Scientific Name	Counts	Location	Lat	Lon	Start date	Finish Date	EPBC	NCA	BAMM (BRBS)
Grey-crowned Babbler	Pomatostomus temporalis	12	Warroa Station 6	-27.88	150.19	18/10/2000	18/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Warroa Station 5, Moonie Hwy	-27.88	150.18	22/05/2001	22/05/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Warroa Station 5, Moonie Hwy	-27.88	150.18	17/10/2000	19/10/2000			X
Grey-crowned Babbler	Pomatostomus temporalis		Burradoo	-27.92	150.63	1/05/1999	30/06/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		12 Iminbach CWR	-27.93	150.29	14/11/2005	14/11/2005			X
Grey-crowned Babbler	Pomatostomus temporalis		Bulli Creek	-27.96	150.85	10/07/1999	10/07/1999			X
Grey-crowned Babbler	Pomatostomus temporalis		Scrubby Creek	-27.97	150.99	18/05/2003	18/05/2003			X
Grey-crowned Babbler	Pomatostomus temporalis		Scrubby creek	-27.97	150.99	25/08/2007	25/08/2007			X
Grey-crowned Babbler	Pomatostomus temporalis		Scrubby Creek, Gore Hwy	-27.97	150.99	13/04/2001	13/04/2001			X
Grey-crowned Babbler	Pomatostomus temporalis		Wondul shooting Range	-27.99	151.08	27/08/2002	29/08/2002			X
Rufous Fantail	Rhipidura rufifrons		Lower Jinghi Back Road	-26.76	151.03	28/03/2001	28/03/2001	M		
Rufous Fantail	Rhipidura rufifrons		Site #5 Road Res Inverai Rd	-26.77	150.93	13/10/2007	13/10/2007	M		
Rufous Fantail	Rhipidura rufifrons	2	9 Mile Stock Route	-26.86	151.02	21/03/2005	21/03/2005	M		
Rufous Fantail	Rhipidura rufifrons		DandabahCampground	-26.88	151.10	21/09/2007	21/09/2007	M		
Rufous Fantail	Rhipidura rufifrons		DandabahCampground	-26.88	151.10	21/09/2007	21/09/2007	M		
Rufous Fantail	Rhipidura rufifrons		State Forest 183	-27.06	150.89	28/09/2004	28/09/2004	M		
Rufous Fantail	Rhipidura rufifrons		4 bar Property	-27.33	150.93	25/11/2003	25/11/2003	M		
Rufous Fantail	Rhipidura rufifrons		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
Australian Painted Snipe	Rostratula australis		Lake Broadwater Inlet	-27.36	151.10	23/10/2001	23/10/2001	V	V	
Diamond Firetail	Stagonopleura guttata		Cameby Downs	-26.62	150.34	27/05/2003	2/06/2003			X
Diamond Firetail	Stagonopleura guttata		4 Bar Property	-27.33	150.93	19/03/2004	19/03/2004			X
Diamond Firetail	Stagonopleura guttata		Leichardt Hwy	-27.77	150.37	23/05/2002	23/05/2002			X
Diamond Firetail	Stagonopleura guttata		Burradoo	-27.92	150.63	1/05/1999	30/06/1999			X
Freckled Duck	Stictonetta naevosa	1	Lake Broadwater	-27.35	151.10	1/02/2003	2/02/2003		R	
Wood Sandpiper	Tringa glareola		1 Roma Sewage Works 2	-26.60	148.81	20/01/2000	20/01/2000	M		
Wood Sandpiper	Tringa glareola		1 Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995	M		
Common Greenshank	Tringa nebularia		Long Swamp Grassdale	-27.30	151.03	29/12/2007	29/12/2007	M		
Common Greenshank	Tringa nebularia		1 Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
Common Greenshank	Tringa nebularia		L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
Marsh Sandpiper	Tringa stagnatilis		25 Roma Sewage Farm	-26.60	148.81	3/11/1999	3/11/1999	M		
Marsh Sandpiper	Tringa stagnatilis		6 Roma Sewage Works 2	-26.60	148.81	18/03/2001	18/03/2001	M		
Marsh Sandpiper	Tringa stagnatilis		1 Roma Sewage Works 2	-26.60	148.81	20/01/2000	20/01/2000	M		
Marsh Sandpiper	Tringa stagnatilis		Long Swamp grassdale	-27.30	151.03	23/09/2007	23/09/2007	M		
Marsh Sandpiper	Tringa stagnatilis		Lower Broadwater Cons Park	-27.33	151.09	23/11/2004	23/11/2004	M		
Marsh Sandpiper	Tringa stagnatilis		8 Lake Broadwater	-27.35	151.10	19/11/1995	19/11/1995	M		
Marsh Sandpiper	Tringa stagnatilis	5	5 Lake Broadwater	-27.35	151.10	31/10/1995	31/10/1995	M		
Marsh Sandpiper	Tringa stagnatilis		4 Lake Broadwater	-27.35	151.10	30/07/1995	30/07/1995	M		
Marsh Sandpiper	Tringa stagnatilis		5 Lake Broadwater	-27.35	151.10	7/01/1995	7/01/1995	M		
Marsh Sandpiper	Tringa stagnatilis		Lake Broadwater	-27.35	151.08	6/01/2003	19/01/2003	M		
Marsh Sandpiper	Tringa stagnatilis		Lake Broadwater CP	-27.35	151.09	5/01/2005	5/01/2005	M		
Marsh Sandpiper	Tringa stagnatilis		Lake Broadwater Inlet	-27.36	151.09	17/01/2005	17/01/2005	M		
Marsh Sandpiper	Tringa stagnatilis		L Broadwater CP	-27.36	151.10	26/11/2007	26/11/2007	M		
Marsh Sandpiper	Tringa stagnatilis		L Broadwater CP	-27.36	151.10	26/10/2007	26/10/2007	M		
Marsh Sandpiper	Tringa stagnatilis		L Broadwater CP	-27.36	151.10	20/09/2007	20/09/2007	M		
Marsh Sandpiper	Tringa stagnatilis		Lake Broadwater Inlet	-27.36	151.10	12/02/2005	12/02/2005	M		

**Appendix H:**  
**Review of Literature Relevant to the Terrestrial Ecology of**  
**the Study Area**

## APPENDIX H

### REVIEW OF LITERATURE RELEVANT TO THE TERRESTRIAL ECOLOGY OF THE STUDY AREA

#### TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT REPORT – GAS FIELDS COMPONENT

#### AUSTRALIA PACIFIC LNG PROJECT EIS

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## H.1 INTRODUCTION

### H.1.1 BACKGROUND

This document reviews the existing literature relating to the flora, vegetation communities and fauna of the Walloons Gas Field Study Area in the bioregion Brigalow Belt South (BBS), Queensland.

Bioregions represent the primary level of biodiversity classification in Queensland and their geology, climate and flora and fauna assemblages reflect landscape scale patterns (Sattler 1999). The Brigalow Belt stretches for more than 1000km from the Queensland/New South Wales border north to Townsville and covers 34 million hectares. It encompasses a range of climatic conditions and has been split into the Southern and Northern Brigalow Belts due to the geological and climatic differences between the two regions (Sattler 1999; Keto *et al.* 2004).

Brigalow Belt South (BBS) lies south of Alpha in the west and Gladstone in the east and contains 22 provinces, or subregions, which reflect significant differences in geology and geomorphology and hence have characteristic landforms and vegetation. The Walloons Gas Fields occupy part, or all, of seven provinces; Taroom Downs, Southern Downs, Barakula, Dulacca Downs, Tara Downs, Eastern Darling Downs and Inglewood Sandstones (Sattler 1999; Young *et al.* 1999). These provinces are described hereunder.

The current distribution, condition and functioning of vegetation communities within the Study Area can be used to predict the current status and distribution of biodiversity and therefore any potential impacts disturbance could cause (FERA 2001). The Regional Ecosystem (RE) concept (Sattler and Williams 1999) has been introduced by the Queensland State Government as a framework for the conservation of native biodiversity across the State. The underlying foundation of RE theory is that within a defined climatic zone, the combination of biotic and abiotic factors that give rise to a unique suite of biodiversity values can be surrogated by a characteristic vegetation community on a given substrate (Land Zone). Thresholds for the conservation of these REs have been set by the state government through the Queensland *Vegetation Management Act* 1999 (VM Act). These thresholds relate to the

ability of vegetation communities to support biodiversity when viewed at a landscape scale (McAlpine *et al.* 2002; Lindenmayer and Luck 2005).

The vegetation communities of the region provide habitat for native flora and fauna and therefore are surrogates for native biodiversity *per se* (Gotelli and Colwell 2001; Faith 2002; Hamilton 2005). Disturbance of these communities has the potential to affect local biodiversity, ecosystem function and ecosystem services throughout the Study Area (Collard 2007). Ecosystem services are defined as “*the conditions and processes through which natural ecosystems and the species that make them up, sustain and fulfil human life*” (Daily 1997) and are often reflected in ecosystem function (Duelli and Obrist 2003). How vegetation loss within the Study Area may affect stability and sustainability of these systems is briefly reviewed (Ives *et al.* 2000; Fischer *et al.* 2007).

### H.1.2 GEOLOGY AND SOILS

BBS consists of predominantly Jurassic and younger deposits of the Great Artesian Basin and Tertiary deposits with elevated basalt flows. The climate of the area is sub-humid. Isbell (1962) identified five broad soil groups supporting brigalow-dominant vegetation; 1. deep gilgaied clay soils, 2. sedimentary clay soils, 3. alluvial soils, 4. miscellaneous deep clay soils and 5. light-textured red soils. The two main clay groups (1 and 2) cover approximately 86% of the Brigalow belt (Isbell 1962) and predominate in landscapes associated with the various Brigalow *Acacia harpophylla* communities (Gunn 1984).

Gilgai comes from the aboriginal word for ‘small waterhole’ and refers to soils with alternating mounds and depressions, which result in an irregular undulating land surface. The deep gilgaied clays tend to occur on flat gently undulating landscape. The soils have great depth (3-4.5m), a coarse structure and exhibit moderate to strong micro-relief with vertical intervals commonly 0.6-0.9m and as great as 1.5m (Isbell 1962, Coaldrake 1970; Russell 1973). The gilgai micro-relief results form shrink-swell properties whereby the soils tend to shrink and crack when dry. The cracks assist with infiltration when it rains. As the wet soil expands the cracks close up thus preventing loss of soil moisture through evaporation (Gunn 1984; Lloyd 1984b). These shrink-swell mechanisms are advantageous for cropping as

they permit the deep clays to absorb and hold large quantities of plant-available water for long periods of time.

## H.2 THE PRE-EUROPEAN LANDSCAPE

### H.2.1 MAJOR VEGETATION COMMUNITIES

The Brigalow Belt derives its name from the open forest and woodland communities characterised by Brigalow open forest and woodland, which once characterised much of the fertile lands of the region (Johnson 1981, 1984). The Study Area itself is located within the rangeland part of Brigalow Belt South. These rangelands include mixed eucalypt open forests and woodland dominated by ironbarks (*Eucalyptus crebra*; *E. fibrosa* subsp. *nubila*, *E. melanophloia*), Poplar Box *E. populnea*, Lemon-scented Spotted Gum *Corymbia citriodora*, Mountain Coolibah *E. orgadophila*, bloodwoods (e.g. *Corymbia trachyphloia*, *C. hendersonii*) with shrubby understoreys of variable density; semi-evergreen vine thickets (SEVT), Brigalow-Belah *Casuarina cristata* forests, White Cypress Pine *Callitris glaucophylla* open forests, casuarina open forests and woodlands, and tussock grasslands (*Dichanthium* spp.) (Isbell 1962; Johnson 1964; Neldner 1984). The brigalow communities occur on the clay plains, with eucalypt communities on the lighter textured soils and vine thickets/dry rainforest often occurring on hill slopes or in sheltered positions (Johnson 1984).

### H.2.2 DISTRIBUTION OF VEGETATION ACROSS THE LANDSCAPE

The major landscape context and vegetation communities of these provinces are summarised hereunder based on their description in Sattler and Williams (1999). Such a small part of the Walloons Gas Fields fall within the provinces of Barakula and Tara Downs that they are not included.

**Province 25, Taroom Downs:** the northern section of the Woleebee tenement is situated within this province. This is an undulating province formed on the argillaceous sediments of the Injune Downs Group of the Great Artesian Basin. The vegetation is dominated by Brigalow, with areas of vine thicket and Bluegrass *Dichanthium sericeum* downs.

**Province 26, Southern Downs:** the major portion of Combabula tenement is situated

within the north-eastern portion of this province. Only very minor parts of this province extend into the mid section of the Condabri tenement and south-west corner of Carinya tenement. This province is based on the Jurassic and Cretaceous sediments that outcrop around the rim of the Great Artesian Basin. These are predominantly fine grained, forming a low, hilly landscape including the watershed formed by the Great Dividing Range. Vegetation includes Belah, Brigalow, Poplar Box and Narrow-leaved Red Ironbark *E. crebra* woodland and open forest communities, and less extensively Lemon-scented Spotted Gum, Dusky-leaved Ironbark *E. fibrosa* subsp. *nubila*, semi-evergreen vine thicket, native grassland (*Astrelba* spp.) and acacia communities.

**Province 28, Dulacca Downs:** the major central sections of Carinya and Dalwogan tenements occur within this province. This province is comprised of undulating to low, hilly country on deeply weathered and dissected fine-grained Cretaceous sediments and associated colluvium and alluvium. Plains and lower slopes are predominantly Brigalow, Belah and/or Poplar Box communities, with additional communities containing Narrow-leaved Red and Dusky-leaved Ironbark and acacia species on dissected lateritised sediments of hilltops, crests and scarps.

**Province 31, Eastern Darling Downs:** the central and northern section of Talinga tenement is located over the western edge of this province. This area is described as having substrates of alluvial soils of varying age along the Condamine River plain. The vegetation communities on basalt are predominantly woodlands of Narrow-leaved Red Ironbark, Yellow Box *E. melliodora*, Forest Red Gum *E. tereticornis*, White Box *E. albens* or Mountain Coolibah.

Prior to clearing, the heavy cracking clays and black earths of the Condamine River plain supported Bluegrass grassland and grassy woodlands of Poplar Box, with Forest Red Gum–River Red Gum *E. camaldulensis* and Rough-barked Apple *Angophora floribunda* adjacent to drainage lines. In the eastern part of the Condamine River plain the black earths appear to have supported grassy woodland of Forest Red Gum and Rough-barked Apple rather than the Bluegrass grasslands and Polar Box woodlands of the central and western parts.



**Province 32, Inglewood Sandstones:** the central and southern sections of Talinga tenement consist of undulating to low hilly country on deeply weathered and lateritised Jurassic–Cretaceous sandstone, with associated colluvial lower slopes and alluvial plains. Major vegetation types include Narrow-leaved Red Ironbark on hillsides; Narrow-leaved Red Ironbark, White Cypress Pine and Bullock *Allocasuarina luehmannii* on solodic soils in gently undulating parts; and Poplar Box on lower slopes and flats. There are also minor areas of Brigalow–Belah.

### H.2.3 FAUNA ASSEMBLAGE AND BIODIVERSITY

BBS has a very large terrestrial vertebrate fauna assemblage. McFarland *et al.* (1999) identified 721 species reliably recorded in the region, comprised of 45 frog, 166 reptile, 394 bird and 116 mammal species. However, 132 of these species have marginal distributions within the region, occurring primarily in other bioregions, and many are known from only one or a handful of records.

Native mammal species recorded in BBS make up 51% of Queensland's non-marine mammals and the region has a higher resident bird species assemblage than any Australian bioregion and is also richer than Brigalow Belt North (Keto *et al.* 2004). Wilson (2003) describes BBS as a 'hotspot' for reptiles, with more than 130 species including three endemic or near endemic species, Golden-tailed Gecko *Strophurus taenicauda*, Brigalow Scaly-foot *Paradelma orientalis* and Dunmall's Snake *Furina dunmalli*.

Nine vertebrates are considered extinct in the Brigalow Belt, including three species of bird, two of which, Paradise Parrot *Psephotus pulcherrimus* and Star Finch *Neochmia ruficauda*, may have occurred in the Study Area. Paradise Parrot is globally extinct (Keto *et al.* 2004). The other six species are mammals, of which Darling Downs Hopping-mouse *Notomys mordax*, Western Quoll *Dasyurus geoffroyi* and White-footed Rabbit-rat *Conilurus albipes* may have occurred in the Study Area. Of these, the Darling Downs Hopping-mouse and White-footed Rabbit-rat are globally extinct. The vertebrate extinction rate averages one species every 18 years since the Leichhardt expedition of 1844–45, and is one of the worst extinction rates of any bioregion in Queensland. The current status of the Spotted-tailed Quoll *Dasyurus maculatus* in

the Brigalow Belt is also uncertain, with the last record of this species in 1990 (Keto *et al.* 2004).

## H.3 HISTORY OF NATIVE VEGETATION DISTURBANCE WITHIN THE REGION

Vegetation community loss due to settlement and agricultural development is by far the most prevalent threat to native biodiversity within the region. In the early part of the twentieth century the large pastoral land holdings were subdivided into perpetual leases or grazing selections of up to 24,000ha. It was subdivision Post World War II (*Lands Act Amendment Act 1952*) and the introduction of mechanical clearing that led to the first large wave of clearing. Since the 1950s there has been periods of expansion and contraction of cash cropping (Lloyd 1984a), although agricultural land use still dominates the region. The second wave of large scale clearing occurred prior to the introduction of the VM Act when 59% of the trees remaining in the Brigalow Belt were cleared between 1997 and 1999 (Cogger *et al.* 2003), leaving only 43% of its pre-clearing extent.

The clearance of native vegetation in the region has occurred primarily on land types with high tree cover that occur on fertile, well-structured soils, chiefly *Acacia* spp. on clay and the denser forest communities including woodland on alluvium. Brigalow and SEVT communities generally dominate the clay soils of higher fertility. Consequently Brigalow vegetation coverage has been reduced to approximately 660,000ha, less than 10% of its original extent, primarily as a result of land clearing for agricultural development. In terms of tree loss, clearing of remnant areas of "Brigalow open forest and woodlands" killed an estimated 60 million trees a year within this broad vegetation group and accounted for about one third of all trees cleared from remnant vegetation in Queensland during two years (1997–99). During these two years nearly six out of every 10 trees cleared (58.8%) in Queensland were in the Brigalow Belt Bioregion (Cogger *et al.* 2003).

As productive areas of native vegetation have become exhausted through clearing or protected, clearing has progressed substantially in areas of eucalypt woodland with low-moderate fertility (chiefly eucalypt on texture contrast soils in this region) and there is an

increasing trend for clearance of even low fertility woodlands such as those represented as eucalypt on sand. For example, Polar Box-dominated communities accounted for over 60% of the pre-European landscape (Land and Water Australia 2005) and the clearing of an estimated 44 million trees a year from remnant Poplar Box and Silver-leaved Ironbark *Eucalyptus melanophloia* woodlands accounted for the second largest proportion (23%) of trees cleared from remnant areas in the 1997-99 period (Cogger *et al.* 2003). This combination of clearing means that at present approximately 30% of the Study Area is covered with remnant native vegetation (DERM 2009).

#### **H.4 FACTORS AFFECTING VEGETATION COMMUNITY CONDITION**

Next to actual loss, condition is the most important factor influencing the biodiversity surrogacy of native vegetation communities. That is, factors affecting vegetation community condition determine, in part, the amount and make-up of biodiversity contained within a community (Boulter *et al.* 2000; Franks *et al.* 2000; DNR 2001; Ross *et al.* 2002). The main factors affecting the condition of those vegetation communities described above are: grazing; logging; erosion; salinity; soil fertility; fire regimes and weed invasion (Arnold *et al.* 1987; McIntyre and Hobbs 1999; Tschardt *et al.* 2002).

Many factors affecting patch condition are consequences of edge effects associated with fragmentation (Ries and Sisk 2004). The concomitant increase in edge:area ratio with a decrease in patch size leads to an increase in biophysical effects on a greater proportion of the patch (Fahrig 2003; Lindenmeyer and Fischer 2006). In agro-ecosystems (grazing lands or arable fields) these edges tend to be abrupt with a relatively harsh matrix (Dauber and Wolters 2004). This leads to steep environmental gradients and edge effects that penetrate deeply into remnant patches and an increase in susceptibility to fire. There is much debate about the nature of these impacts but generally these effects have a negative impact on biodiversity and ecosystem function (Forman and Godrun 1995; Murcia 1995; Fox *et al.* 1997; Luck *et al.* 1999; Piper and Catterall 2004; Ries and Sisk 2004).

##### **H.4.1. IMPACTS OF GRAZING ON VEGETATION COMMUNITY CONDITION**

Grazing by domestic stock has the greatest impact on vegetation community condition and threatens the persistence of many of the threatened plant species within the region. Between 65% and 80% of BBS is grazed (DNR 2001), impacting vegetation condition both directly through loss of vegetation and indirectly through soil compaction and trampling leading to erosion and loss of top soil and fertility, preventing regrowth and decreasing vegetation community resilience.

Vegetation communities that provide more fodder for cattle can often be affected disproportionately with little difference in grazing preference between mixed eucalypt types (FERA 2001). High grazing pressure has been found in commercial Lemon-scented Spotted Gum forest, grassy woodlands and *Callitris* forest (FERA 2001) with the highest pressures being in Brigalow communities. Mediating factors that also influence the impacts of grazing include the distance from waterholes, inappropriate stocking rates, use of less valuable grazing areas during drought and post-fire grazing impacting regeneration (Landsberg *et al.* 1997; DNR 2001).

##### **H.4.2 LOGGING**

According to historical logging records all forest types were logged extensively apart from closed softwood scrub and open ironbark forests. Whereas commercial hardwoods and eucalypt/*Callitris* mix were logged heavily, other communities that were logged extensively would be expected to have low levels of logging (Queensland Department of Natural Resources 2001).

##### **H.4.3 RUNOFF**

Some Brigalow soils are prone to water erosion. Soils that are exposed through overgrazing or tree clearing may be vulnerable to high intensity summer thunderstorms (Collard and Zammit 2006), due to low surface protection and an increase in runoff volumes and rates (Cowie *et al.* 2007). Soils on Land Zones 5 and 10 (Sattler and Williams 1999) usually have sandy surfaces and are therefore highly prone to erosion, especially where undulating topography accelerates water movement. Some erosion within Land Zone 3 can be observed generally due to the increase volumes

**Table 2.3. Regional Ecosystems (REs) within the Study Area identified on 1:100,000 RE mapping (DERM 2009a)**

RE	Management Status <sup>1</sup>			EPBC Description	Short RE Description (REDD2)
	EPBC Act	VM Act	EP Act		
11.3.1	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Brigalow Acacia harpophylla and/or Belah Casuarina cristata open forest on alluvial plains
11.3.2	E3	OC	OC	Weeping Myall Acacia pendula Woodlands <sup>3</sup>	Poplar Box Eucalyptus populnea woodland on alluvial plains
11.3.3		OC	OC		Coolibah Eucalyptus coolabah woodland on alluvial plains
11.3.4		OC	OC		Queensland Blue Gum Eucalyptus tereticornis and/or Eucalyptus spp. tall woodland on alluvial plains
11.3.14		LC	NC		Eucalyptus spp., Angophora spp., Callitris spp. woodland on alluvial plains on sandy soils
11.3.17		OC	E		Poplar Box Eucalyptus populnea woodland with Brigalow Acacia harpophylla and/or Belah Casuarina cristata on alluvial plains
11.3.18		LC	NC		Poplar Box Eucalyptus populnea, White Cypress Pine Callitris glaucophylla, Buloke Allocasuarina luehmannii shrubby woodland on alluvium
11.3.19		LC	NC		White Cypress Pine Callitris glaucophylla, Corymbia spp., and/or Silver-leaved Ironbark Eucalyptus melanophloia woodland on Cainozoic alluvial plains
11.3.25		LC	OC		Queensland Blue Gum Eucalyptus tereticornis or River Red Gum E. camaldulensis woodland fringing drainage lines
11.3.26		LC	NC		Gum-topped Box Eucalyptus moluccana or Inland Grey Box E. microcarpa woodland to open forest on margins of alluvial plains
11.3.27b		LC	OC		Palustrine wetland

and speed of delivery from waters running off surrounding cleared lands (Caroll *et al.* 2000; Loch 2000).

#### H.4.4 SALINITY

Removal of native vegetation within catchments with shallow saline water tables has the potential to cause secondary salinisation and die-back of both agricultural and natural lands (Cramer and Hobbs 2002). The Condamine-Balonne and Border Rivers catchments are known to have groundwater levels within two metres (at risk) of the surface across some 17,500 ha. The impacts of removal of native vegetation within the Study Area may not become apparent for 50-80 years after clearing (Biggs *et al.* 2008).

#### H.4.5 SOIL CONDITION

Site stability, infiltration and nutrient cycling within intact remnants can be impacted through logging, grazing and burning regimes. Land and Water Australia (2005) found that soils of Poplar Box communities within the region are in average to poor condition when compared to other grassy woodlands in Australia. Declines in soil fertility have been found to be due to intensive summer and winter crop rotation (Webb 1984a) in agricultural areas within the region. These declines in soil condition have consequences for community resilience and for rehabilitation of degraded areas.

#### H.4.6 THICKENING

Investigation of Poplar Box woodlands within the region has shown that the structure of woodlands is undergoing significant change and woodland thickening is apparent (Land and Water Australia 2005), especially by the increased density of False Sandalwood *Eremophila mitchellii*. The phenomena of woodland thickening has been demonstrated for parts of central and northern Queensland (Fensham and Fairfax 2003 a, b; Fensham *et al.* 2003), although mechanisms are not quite clear at present (Debus *et al.* 2009).

#### H.4.7 FIRE

Fire is a natural phenomenon in the vegetation communities of the Study Area. Human-induced changes to fire regimes, both pre- and post-European settlement, have impacted upon the characteristics of vegetation communities. At a landscape scale each fire regime

component (e.g. intensity, speed) will exhibit variation, and the nature of this variation will have important ecological consequences (Gill 1999; Gill *et al.* 2009). This variation creates a mosaic of burning response across the landscape (Myers *et al.* 2004). In addition to burning, the impact of a fire on vegetation continues long after it has passed through an area and includes the propagation of weeds from the soil seed bank and the erosion of soil and loss of valuable nutrients as the protective cover of vegetation has been removed. Conversely fire can stimulate growth by release of nutrients especially phosphorus, inorganic carbon and nitrates, increased moisture availability, and removal of competitors, with many eucalypt dominated woodlands and open forests showing declines in canopy health when fire is excluded (Gill *et al.* 2009).

Intensity, frequency and timing mediate the effects of fires on vegetation communities. High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition is listed as a key threatening process on Schedule 3 of the *Threatened Species Conservation Act 1995*. At a regional scale, fire is generally insignificant in most years, with a maximum of 3.5% of the bioregion burnt in 2004 (DEWHA 2008), with rainfall being the over-riding factor influencing natural fire frequency in this landscape (Myers *et al.* 2004). Fragmentation has isolated patches and stopped the spread of wildfires, decreasing the area burnt annually.

Historically, aboriginal fires were lit in autumn and winter, whilst early farming practices lit fires in spring when conditions promote the rapid regrowth of vegetation. It is now common for fires to be lit in autumn when conditions are unfavourable for the growth of most native plants. Post-European settlement, changes in the fire regime, particularly a decline in fire incidence due to an absence or marked reduction of herbaceous fuel, was a direct consequence of over-grazing. The replacement of perennial grasses by ephemeral grasses and herbs may have strengthened the dependence of the fire cycle on sporadic climatic events (Myers *et al.* 2004). A decrease in fire frequency over the past 200 years is also a possible cause of vegetation thickening in uncleared remnants (Fensham and Fairfax 2003a).



Interacting with this mosaic of a fire's physical properties is its interaction with contrasting flora species life-history characteristics or attributes that mediate a fire's effects. Different functional types of plants will have differential sensitivity to recurrent disturbances such as fire (Noble and Slatyer 1980). The differing proportions of fire sensitive species within given communities will dictate the ways in which these communities respond to fire. Evidence suggests that such 'fire interval sensitive' species may be found in a wide range of Australian plant communities (Bradstock *et al.* 2002). Below is a brief description of what is known about the general responses of the dominant vegetation communities within the region.

### **Cypress Woodlands**

*Callitris* is an obligate seeder and adult trees die when the crown is completely burnt. Regimes of frequent, intense late dry season fires every one to two years cause declines in the extent of these woodlands.

### **Brigalow**

Brigalow is not naturally prone to fires as the phyllode litter is fire resistant and little grass naturally occurs. Brigalow is well known for being able to regenerate from root suckers. When they do burn, Brigalow communities are particularly susceptible to fire, with hot fires being able to burn mature vegetation (Butler and Fairfax 2003). Johnson (1964) noted that under most circumstances the practice of burning tends to induce suckering from lateral Brigalow roots. If no further management is applied to a burnt Brigalow community, it is likely to revert to its original condition.

### **Mulga, Bendee, Lancewood and Gidgee**

Mulga, Lancewood, Bendee, Gidgee (and many smaller shrub-sized taxa) are obligate seeders; and therefore die under hot fires and may take several years (depending on rain) to re-sprout.

### **Semi-evergreen Vine Thicket**

SEVT ecosystems are generally fire sensitive, although some individual plant species have the capacity to propagate from roots and trunks after minor fire damage. This fire sensitivity means that the community often relies on Brigalow trees and other vegetation to serve as a buffer to prevent the incursion of fires into remnants.

## **Eucalypt Forest and Open Woodlands**

Woodland plants exhibit a variety of ways of coping with and regenerating from fire. Eucalypts and other tree species such as *Casuarina* and *Brachychiton* typically re-sprout after fire. Individuals of other species such as some acacias and *Callitris* may be killed when fires fully scorch the crowns. Some shrub species re-sprout after fire while others don't. Fire may promote seedling regeneration in these communities by opening up space and increasing other resources but the exact role of fire in recruitment is still unclear in many cases.

### **H.4.8 WEEDS**

Plant invasions into natural ecosystems are one of the major threats to the conservation of biological diversity. Invasions by exotic plant species have a deleterious effect on vegetation community condition and the survival of individual native plant species (Fox and Fox 1986; Adair and Groves 1998). There are, however, considerable differences in the level of invasion, both between and within vegetation communities. Substrate characteristics (Walter *et al.* 2002), native community diversity (Lonsdale 1999; Hector *et al.* 2001), disturbance history and proximity to human developments are key factors that influence the extent and pattern of invasion (Fox and Fox 1986) through influences on dispersal, establishment and survival of weed species.

The effects of exotic plant species include direct effects such as exclusion by smothering, competition for nutrients, prevention of regeneration, and indirect effects such as nutrient depletion, nutrient enrichment, increased fire intensity or frequency (Wardle *et al.* 1998). The actual impacts of weed species vary according to life-history traits of the weed species and the characteristics of the invaded community (Hector *et al.* 2001). The presence of some weed species can alter the trajectory of regenerating vegetation communities preventing the establishment of the original vegetation community, leading to an alternate, often less diverse, stable community (Doherty 1998; Laval and Garnier 2002). All weed species of note within the Study Area require elevated resources and are therefore more likely to invade communities on more fertile soils.

The most important weeds known to occur in the Brigalow Belt South bioregion include; *Athel*

Pine *Tamarix aphylla*, Mesquite *Prosopis* spp., *Parkinsonia Parkinsonia aculeata*, *Parthenium Parthenium hysterophorus*, Prickly Acacia *Acacia nilotica* subsp. *Indica*, Prickly Pear *Opuntia stricta*, Tree Pear *Opuntia tomentosa*, *Harrisia Cactus Eriocereus martini*, Mother-of-millions *Bryophyllum delagoense*, African Boxthorn *Lycium ferocissimum*, Noogoora Burr *Xanthium pungens*, Johnson Grass *Sorghum halepense* and Giant Rat's Tail Grass *Sporobolus jacquemontii*. The Brigalow Belt region was one of those worst affected by Prickly Pear. Successful control was achieved between 1925-32 using the larvae of the Cactoblastis Moth *Cactoblastis cactorum*. This was one of the best examples of effective biological control of a weed anywhere in the world (Mann 1970; Hando and Hando 1997). None of the other weed species listed above are currently known to be at a nuisance level within the Study Area, however some of these species have the potential to have serious deleterious effects upon the condition of native vegetation communities, especially *Parthenium* (McFadyen 1984).

### Exotic Pasture Grasses

Intensive development of exotic pastures of Buffel Grass *Pennisetum ciliaris*, and to a lesser extent Rhodes Grass *Chloris gayana* and Green Panic *Megathyrsus maximus* (Lonsdale 1994; Fairfax and Fensham 2000; Jackson 2005) is potentially detrimental to the capacity of the soils to sustain development as clearing impinges on more marginal lands and the imminent loss of biodiversity (McAlpine *et al.* 2002).

Buffel Grass invasion increases ground fuel loads in native wooded communities, and is also facilitated by burning, producing positive feedback between Buffel Grass and fire. The result is accelerating remnant degradation, making the interaction between Buffel Grass and fire an important target for management measures (Butler and Fairfax 2003; Clarke *et al.* 2005). This process is especially hazardous to the edges of SEVT.

## H.5 FACTORS AFFECTING FAUNAL ASSEMBLAGES

In 2001 approximately 43% of the Brigalow Belt bioregion was mapped as remnant vegetation. The majority of the historical and more recent clearing had occurred within the Brigalow,

softwood scrubs, grasslands and alluvial vegetation types (Wilson and Neldner 2001).

### H.5.1 FRAGMENTATION AND EDGE EFFECTS

A consequence of clearing of native vegetation is that the remaining vegetation is usually in fragments. These fragments are often referred to as patches, remnants or habitat islands and they are surrounded by a matrix of different vegetation and/or land use. Fragmentation of habitat alters the microclimate of each patch through changes in solar radiation, wind and water, with the degree of effect determined by the patch's size, shape and position in the landscape (Saunders *et al.* 1991; Murcia 1995).

Changes to solar radiation may affect shade-tolerant species, soil micro-organisms, invertebrates, litter decomposition, soil moisture retention and nutrient cycling. Fragmentation increases the exposure of vegetation to wind which may cause physical damage and increase evapotranspiration due to decreased humidity and increased desiccation. Windthrow (trees being blown over) of large trees changes the vegetation structure and increases recruitment of pioneer species. Increased litter fall due to wind damage may alter soil surface characteristics and microhabitats for ground-dwelling fauna (Saunders *et al.* 1991).

Exfoliating bark may be blown from trees, removing shelter for some arboreal vertebrate species and reducing invertebrate prey. Wind shear and disturbance to the canopy can deleteriously affect bird breeding success. Increased wind speed can increase the transfer of dust, insects and seeds, including exotic species, from the surrounding matrix. The local water regime is altered by fragmentation through changes to the hydrological cycle. Loss of vegetation alters rainfall interception and soil moisture. Surface and groundwater flows may increase when deep-rooted trees are replaced by crop and pasture species and the hydrological system is less buffered against extreme events. Increased surface flows may result in greater erosion in patches in areas of run-off and patches in run-on areas will have increased deposition. Rises in water tables can also cause salination, which may affect both remnant vegetation and the agricultural matrix (Saunders *et al.* 1991).

How fauna responds to the effects of fragmentation in any particular patch depends, in part, on the time the patch has been isolated



and the degree of isolation (Saunders *et al.* 1991), though species richness and abundance generally declines with decreasing patch size and clearing (Hannah and Thurgate 2001). The size and spacing of forest and woodland also has an effect, species may be deterred from settling in locally suitable habitat patches if the landscape is unattractive on a larger scale as it contains only small and scattered patches (Hinsley *et al.* 1998).

Clearing of vegetation for agriculture and other human activities is not random. Areas most suitable for agriculture, based on characteristics such as rainfall, soil quality and elevation, often also support the most species of fauna and flora (Seabloom *et al.* 2002). Species may become locally extinct, with such extinctions occurring most quickly in species that are dependent on native vegetation, require large territories, and/or exist at naturally low densities. Species loss from a patch subsequent to isolation can take decades, even for some invertebrates (Saunders *et al.* 1991) and it is not always easy to identify the species most at risk from landscape change (Lindenmayer and Fischer 2006).

## H.5.2 LIVESTOCK

Livestock grazing profoundly changes ecosystems, altering vegetation structure and composition and changing the physical and chemical properties of soil. The understorey is particularly affected, with a reduction or removal of the native shrubs and herbaceous perennials (Scougall *et al.* 1993; Abensperg-Traun *et al.* 2000; Yates *et al.* 2000). The severity of grazing influence varies among soil and vegetation types. For example, trampling by livestock alters soil structure, particularly in soils with relatively high clay content. Trampling can lead to significant reductions in litter and soil crust cover and increase in penetration resistance, which reduces water-infiltration rates and results in a less-buffered soil microclimate (Yates *et al.* 2000; Hobbs 2001). Soil type and moisture regimes are probably more important for some frog species than tree clearing (Hannah and Thurgate 2001) and changes in soil moisture and penetrability of soils can have an important influence on habitat choice in burrowing frogs (Chambers 2008). Livestock also often congregate in the more productive parts of pastures and near waterbodies, having deleterious impacts on fauna that use such areas (Jansen and

Robertson 2001, Lindenmayer and Fischer 2006).

There is a strong negative association between grazing and the presence of mistletoe. Mistletoes are sensitive to reductions in water availability and grazing alters water relations through soil compaction, reduced leaf litter cover and higher soil temperatures within woodland patches. Grazing also modifies shrub cover and density which may reduce or remove dispersers of mistletoe such as Singing Honeyeaters *Lichenostomus virescens*, which further reduces mistletoe abundance (Norton *et al.* 1995). Mistletoe is the key food resources for the conservation significant Painted Honeyeater *Grantiella picta*.

The other major influence of livestock grazing is its interaction with weed invasion which is enhanced by disturbance and the addition of nutrients (Hobbs 2001; Lindenmayer and Fischer 2006).

## H.5.3 ENVIRONMENTAL WEEDS

In terms of detrimental impacts on fauna the most important introduced plant species is the pasture grass Buffel Grass. In many areas Buffel Grass is gradually establishing as understorey cover in the less closed forests. As areas of forest are regularly burnt the Buffel Grass tends to burn very hot such that native trees shrubs are destroyed (Smyth 1997). There is a positive feedback between Buffel Grass and fire with increased ground fuel loads in woodlands accelerating remnant degradation as subsequent fires reduce the basal area of living trees and increase the cover of both Buffel Grass and other weed species (Butler and Fairfax 2003). In central Queensland the species richness of all fauna groups is lower in areas dominated by Buffel Grass (Hannah and Thurgate 2001).

## H.5.4 FERAL SPECIES

The fauna assemblage of BBS includes one amphibian, 11 bird and 12 mammal species that are European introductions (McFarland *et al.* 1999), though not all are maintaining viable populations within the region. Predation, competition and habitat alteration by exotic species are seen as important mechanisms of impact on native species (Lodge 1993).

### Cane Toad *Rhinella (Bufo) marina*

Cane Toads have caused extensive mortality, through poisoning, of native frog-eating species particularly mammals such as quolls and reptiles including monitors and a variety of snake species (Burnett 1997; Phillips *et al.* 2003). Consumption of Cane Toad eggs, hatchlings and tadpoles has been found to be always lethal to native tadpoles, snails and fish (Crossland and Alford 1998). Cane Toads influence native frog populations both directly and indirectly and the effects may be positive or negative depending on the density of Cane Toads and the species of native frog in question. Mortality through attempted predation of Cane Toad eggs and tadpoles by one native frog species may benefit another species, altering the structure of frog communities (Crossland 2000).

Cane Toads have been spreading through parts of the Study Area (Hando and Hando 1997) and could negatively affect the growth and survival of native frogs of the Murray-Darling catchment (Williamson 1999). The two conservation significant camaenid land snails known in the Study Area may be threatened by predation (Pearson *et al.* 2009).

#### **Common Myna *Sturnus tristis***

Common Mynas extend into rural areas along roads and occur around settlements, in agricultural areas and other modified habitats. They are aggressive and often attack other species and will expel native species from tree hollows (Higgins *et al.* 2006). Common Mynas could have adverse effects on breeding success in native parrots (Pell and Tidemann 1997a, b).

#### **Red Fox *Vulpes vulpes***

Foxes are highly adaptable omnivores, killing or scavenging food such as rabbits, hares, rodents, frogs and birds as well as invertebrates such as beetles, grasshoppers and earthworms (Bayley 1978; Catling 1988). In most locations mammals probably constitute the majority of their diet (Saunders *et al.* 2004), though they also feed on plant material, particularly fruits and berries. Native fauna species have not developed strategies to avoid Fox predation. In fact, many species do not recognise, or are slow to recognise, the fox as a predator, making them particularly susceptible to predation (Griffin *et al.* 2001; Short *et al.* 2002). Foxes have a major detrimental impact on populations of some small mammals (Saunders *et al.* 1995;

Kinnear *et al.* 1998) and it is now generally recognised that land clearing and predation by introduced predators, particularly Foxes, are probably most responsible for the catastrophic loss of Australian biota (Dickman 1996; Short 1998; Hobbs 2001).

#### **Domestic Dog/Dingo *Canis lupus familiaris/dingo***

Dingoes were brought to Australia from Asia several thousand years ago. The species now occupies the entire Australian mainland. Dingoes are very common in forested areas north of the Dingo Barrier Fence (Hando and Hando 1997). Prey ranges in size from Swamp Buffalo *Bubalus bubalus* to invertebrates, though within a particular region Dingoes specialise on the most commonly available wildlife. Dingoes tend to attack livestock only when native prey is scarce (Corbett 2008). Dingoes may actually help regulate native mammal communities through predation of smaller predators such as foxes, which benefits smaller mammals eaten by foxes, and of kangaroos and rabbits, which reduces overgrazing (Glen *et al.* 2007; Letnic and Koch 2009).

#### **Cat *Felis catus***

Cats are a significant predator of native wildlife and have been implicated in the extinction of native fauna species on offshore islands (Bloomer and Bester 1992) and on mainland Australia (Dickman *et al.* 1993). Cats are adaptable and opportunistic predators. They prefer live prey, particularly animals of less than 600g, which often includes the young of larger mammals, although younger Rabbits appear to be their staple diet when abundant (Robley *et al.* 2004). Cats will also predate on birds, reptiles, invertebrates and carrion (Dickman 1996).

#### **Rabbit *Oryctolagus cuniculus***

Rabbits eat grasses, roots, tree bark, leaves, grains, fruits, seeds and buds. They will select the more nutritious components in a sward and dig below the crowns of grass clumps to eat seeds and roots, thus altering the composition of plant communities and turning woodlands into grasslands. During dry conditions Rabbits may also feed on bark and roots of shrubs, from which they can obtain most of the moisture they require (Williams and Myers 2008).

Rabbits inhibit the regeneration of native vegetation (Lange and Graham 1983; Cooke 1987); compete with native fauna for food (Dawson and Ellis 1979) and shelter (Priddel *et al.* 1995); support populations of foxes and cats (Catling 1988) and cause soil erosion (Norman 1988). The decline and extinction of many of Australia's terrestrial mammals that weigh between 35 and 5500 g, particularly in the arid and semi-arid zones, was associated with the Rabbit's introduction (Calaby 1969).

### **Pig *Sus scrofa***

Feral Pigs are largely omnivorous, favouring succulent vegetation, fruit, grain and animals including earthworms, snails, arthropods, crustaceans, reptiles, eggs of ground-nesting birds or reptiles, small or young mammals and some carrion (Choquenot *et al.* 1996; Heise-Pavlov 2008). They need to drink daily in hot weather and are usually found within two kilometres of water under such conditions. The creation of farm dams and other waterbodies may have facilitated the spread of this species in semi-arid Australia (Mitchell 1993; Roberts *et al.* 1996). Pigs degrade habitat through surface soil destruction due to their foraging techniques. They up-root plants which facilitates erosion and most damage occurs in areas where the soil is soft such as around wetlands, swamps, lagoons, creeklines and associated watercourses, or in low-lying areas after rain. This reduces regenerating forest plants and facilitates the invasion of both native and introduced weed species (Alexiou 1983; Statham and Middleton 1987; Hone 1995). Foraging around wetlands by Pigs means that frogs are a common food item in some areas and feral pigs, through either direct predation or habitat disturbance, may have contributed to the declines in some populations of Australian frogs Richards *et al.* (1993).

### **Goat *Capra hircus***

Goats have a significant impact on the composition of vegetation communities, even when they occur in low numbers, due to their broad dietary tolerance. When they occur in high numbers, they are capable of removing all foliage below 1.8m (and sometimes higher), decimating the vegetation. They suppress regeneration and contribute to erosion through a combination of vegetation removal and breaking the surface of soil with their hooves. The Goat has contributed to the decline of native mammals through competition for

resources such as food, water and shelter and by altering ecosystems (Parkes *et al.* 1996; Henzell 2008).

### **H.5.5 NATIVE INCREASER SPECIES**

There are a number of medium to large-bodied generalist species that increase in patches of vegetation surrounded by agricultural land. These 'increaser' species include Crested Pigeon *Ocyphaps lophotes*, Australian Magpie *Cracticus tibicen*, Pied Butcherbird *C. nigrogularis*, Torresian Crow *Corvus orru* and Noisy Miner *Manorina melanocephala* and their increase in abundance coincides with a decrease in smaller bird species, particularly insectivores (Loyn 1987; Martin *et al.* 2006; Woinarski *et al.* 2006). Many of the increaser species are nest predators (Piper and Catterall 2004) and actively exclude smaller species from patches (Grey *et al.* 1998). Noisy and Yellow-throated miners *Manorina flavigula* in particular, often exclude small insectivorous species through the aggressive communal defence of the colony's territory (Grey *et al.* 1997).

### **H.5.6 ROADS, TRACKS AND VEHICLE TRAFFIC**

Roads and corridors, such as pipelines, result in habitat loss and modification, create edge effects, and may divide and isolate populations by acting as a barrier, disturb fauna through noise of traffic, result in road-kills, increase sedimentation, and facilitate the invasion of weeds and provide easy access to habitat for exotic predators (Andrews 1990). The abundance and activity of Cane Toads increases along roadways (Seabrook and Dettmann 1996) and wild dogs and foxes are known to follow roads and often double back and make small hunting detours off the road (Edwards *et al.* 2000).

The impact of road mortality on reptile and amphibian populations is thought to be more significant than on small mammals (Bennett 1991; Fahrig *et al.* 1995).

## **H.6 EXTANT VEGETATION COMMUNITY TYPE, DISTRIBUTION AND CONDITION WITHIN THE STUDY AREA**

The relatively stable scene that remains after the cessation of broad-scale clearing in 2003 (VM Act; EPBC Act) is a predominantly cleared landscape dominated by pastures highlighted



by a few large native wooded systems and retained linear wooded vegetation within road reserves, along creek lines and within retained shelter belts (West *et al.* 1999; Queensland Department of Natural Resources 2001). The Brigalow Belt bioregion is considered to be rich floristically with over 96 Endangered and Vulnerable plant species, and 83 Endangered and Of Concern regional ecosystems (Leverington and Playford 2001). In the Brigalow Belt are Semi-evergreen Vine Thickets (softwood scrubs contained in 7 REs), and brigalow communities (14 REs), accounting for 21 of the 29 Endangered regional ecosystems in the bioregion. The distribution and condition of the extant remnant vegetation across this landscape is largely dictated by the suitability of soils for agricultural use. This distribution and condition is outlined below.

Much of the cleared agricultural land within the Study Area can be described as gently undulating plains formed from geologically relatively young fine-grained sediments, forming deep texture contrast soils or more predominantly black, dark brown and grey-brown cracking clay soils, that are often self mulching and sometimes gilgaied in flatter areas (Land Zone 9). The predominant land use within these areas is grazed pasture, characterised by a mixture of exotic (e.g. Buffel Grass, Rhodes Grass) and native grass species (e.g. *Dichanthium sericeum*, *Chloris divaricata*) interspersed with narrow wooded shelter belts and very small shade stands dominated by Brigalow, Poplar box, and/or White Cypress Pine. Large intact remnants of these communities are rare within the Study Area. Where uncleared, these soils support the remaining patches of Brigalow-Belah open forest, Poplar Box open forest and rarely, vine thicket. Brigalow-Belah communities are characterised by a canopy of Brigalow and/or Belah often with a lower tree and shrub layers of Wilga *Geijera parviflora* and False Sandalwood and occasionally with an emergent layer of Poplar Box.

Poplar Box communities without lower tree layers and an open to dense tall shrub layer are always present, with or without Silver-leaved Ironbark and often with False Sandalwood as a dominant species. A patchy low shrub layer of varying density may be formed, where the tall shrub layer is more than six metres tall. The ground layer is dominated by perennial grasses

and varies from sparse to dense, depending on the shrub and tree density.

Very rarely these soils support vine thickets that are characterised by either a canopy of species such as Silver Croton *Croton insularis*, and/or *Denhamia oleaster*, or the canopy is dominated by a mixture of Brigalow, Poplar Box and Belah, with occurrences of Bottle Tree species (*Brachychiton* spp.) and Ooline *Cadellia pentastylis*. These vine thickets are often dense and diverse with a low shrub layer (2-6m high) dominated by species such as *Ehretia membranifolia*, *Apophyllum anomalum*, *Geijera parviflora*, *Capparis* spp., *Croton phebaloides*, *Erythroxylum australe*, *Alectryon diversifolius* and *Carissa ovata*.

Creek systems within the Study Area are fringed by relatively young (Cainozoic) alluvial deposits. These soils are predominantly texture contrast soils, deep uniform clays, massive earths, loams, sandy soils and sometimes cracking clays, formed on Cainozoic alluvial plains. These soils support open forests generally dominated by Poplar Box, Forest Red Gum, River Red Gum, Smooth-barked Apple *Angophora leiocarpa*, Rough-barked Apple and more rarely Coolabah *Eucalyptus coolabah*. The lower tree and shrub layers are characteristically medium-dense and populated by a mixture of species including; Black Tea-tree *Melaleuca bracteata*, Weeping Bottlebrush *Callistemon viminalis*, Wilga, False Sandalwood, Sally Wattle *Acacia salicina*, Weeping Myall *Acacia pendula*, and White Cypress Pine. Where less impacted by cattle grazing, the grassy understorey is often dominated by Forest Bluegrass *Bothriochloa bladhii* subsp. *bladhii*, Wire grass *Aristida* spp., Black Speargrass *Heteropogon contortus*, Bluegrass *Dichanthium* spp. and Kangaroo Grass *Themeda triandra*. Much of this vegetation has been retained throughout the landscape, often forming sinuous narrow corridors snaking across open grazed paddocks or forming denser more fertile corridors through retained open forests and woodlands. Although much of this vegetation has been retained it is often subject to grazing pressure and exotic grass invasion, diminishing its condition substantially.

The mesozoic medium to large grained sandstones of the area usually form plateaus, scarps and hills (Land Zone 10). These medium to coarse-grained sandstones

characteristically form texture contrast soils with a sandy surfaces of varying depth or deep uniform sandy soils and some lithosol soils. These soils are predominately vegetated by eucalypt open forests and woodlands dominated by Lemon-scented Spotted Gum, Poplar Box, Narrow-leaved Ironbark, Silver-leaved Ironbark or Belah. The lower tree and shrub layers within these systems are characterised by Belah, Black Wattle *Acacia leiocalyx*, Sweet Bursaria *Bursaria spinosa*, Geebung *Persoonia falcata*, and/or Quinine Bush *Petalostigma pubescens*, with a characteristically sparse ground layer in its undisturbed state. The vegetation on the more rugged scarps and hills is usually retained, whilst some clearing to establish grazing pastures has occurred on plateaus. Condition of these forests types can be severely affected as sandy surface soils are very prone to erosion and trampling by cattle. Large tracts of woodland and open forest on Land Zone 10 occur in state forests, such as Woodduck, Combabula, Condamine, and Yuleba, where they are retained for Lemon-scented Spotted Gum and ironbark timbers.

Extensive, uniform, near level or gently undulating Cainozoic plains and plateau remnants usually overlying duricrust, have been formed on deeply weathered surfaces of coarse sandy soils. These soils include duplex, deep texture contrast with thick sandy surface horizons, and deep red earths. The vegetation on these soils is often dominated by open eucalypt forests and woodlands characterised by the presence of Poplar Box, Narrow-leaved Ironbark and Silver-leaved Ironbark, with associated canopy species such as Spotted Gum, Clarkson's Bloodwood *Corymbia clarksoniana*, Dallachy's Bloodwood *Corymbia dallachiana*, Smooth-barked Apple and White Cypress Pine. Lower tree and shrub layers are usually dominated by False Sandalwood, White Cypress Pine, Wilga, Bulloak, Black Cypress Pine *Callitris endlicheri*, Pretty Tea-tree *Melaleuca decora*, Ironwood *Acacia excelsa* and Black Wattle, in varying degrees of dominance. The ground layer is generally sparse in undisturbed condition. These large deeply weathered sand plains are highly erodible and provide inherently poor fertility and are therefore generally uncleared. They are often retained within state forests for timbers such as Lemon-scented Spotted Gum and White Cypress Pine.

Scattered throughout this landscape are usually relatively small patches of resistant Cainozoic duricrusts forming mesas or scarps. These duricrusts resist weathering and thus form shallow to very shallow lithosols with surface stone and boulders that support open forests dominated by acacias such as Lancewood *Acacia shirleyi*, Bendee *Acacia catenulata* and woodlands of eucalypts such as Narrow-leaved Ironbark, Gum-topped Ironbark *Eucalyptus decorticans*, or Dusky-leaved Ironbark. Shrub layers are often low and sparse comprised of species such as Bitter Bark *Alstonia constricta*, Soft Acalypha *Acalypha eremorum*, Narrow-leaved Croton *Croton phebaloides* and Currant Bush *Carissa ovata*. Where soils exist, ground layers are grassy being dominated by Many-headed Wiregrass *Aristida caput-medusae*, *Paspalidium rarum*, and Hooky Grass *Ancistrachne uncinata*. Remnants of these jump-ups form low stony rises on downs. These areas are vegetated by Blue-leaved and/or Narrow-leaved Ironbark, sometimes co-dominated by Lemon-scented Spotted Gum, Lancewood and/or White Cypress Pine, that can sometimes dominate or become a significant lower tree/tall shrub layer. There is usually a low woodland mid layer dominated by acacias or sometimes Bulloak and Black Cypress Pine.

#### H.6.1 VEGETATION COMMUNITIES UNDER MOST THREAT

##### Brigalow

These woodlands are best developed on the lower slopes of the dissected Tertiary landscape on lateritised Tertiary and pre-tertiary sediments of transported Tertiary-weathered zone material. Soils are usually deep cracking clays often with gilgais. Extensive areas also occur on argillaceous Permian, Jurassic and Cretaceous sedimentary rocks and basic volcanics exposed following the removal of the Tertiary land surface. Soils are mainly medium to heavy clays. Clays and clay loams on recent alluvial plains also support Brigalow communities. Extensive areas of deep texture-contrast soils with a shallow A horizon, which is often more elevated than the clay soils in the catena within the Tertiary weathered zone, carry Brigalow communities usually in association with *Eucalyptus* species. Communities are also found on red and yellow earths (Johnson 1984).

The canopy is usually 10-15m in height, though it can reach 20m in moister areas, with Brigalow being the most conspicuous species. Belah is a common associate and in these stands the relative abundance of these two species can vary from almost pure Brigalow to almost pure Belah. Certain other species of acacia intermix with Brigalow in narrow transition zones. These include *Acacia argyrodendron*, Yarran A. *melvillei*, and Weeping Myall.

A number of *Eucalyptus* species occur as emergents. These include Dawson Gum *Eucalyptus cambageana*, Mountain Coolibah, and Queensland White Gum *E. argophloia* in the Chinchilla area, and Grey Box *E. microcarpa*, and Pilliga Box *E. pilligaensis* in the southern region. A moderately dense to dense understorey of low trees and tall shrubs is usually present. Grassy open-forests are not common and are usually the result of physical constraints such as regular fires or flooding, or represent early seral stages from grassland (Johnson 1984).

Wilga is the most extensive and conspicuous species in central and southern regions where it is commonly associated with False Sandalwood, Limebush *Eremocitrus glauca*, *Apophyllum anomalum*, *Ehretia membranifolia* and *Myoporum deserti*. Brigalow Grass *Paspalidium caespitosum* is invariably present in the ground layer with Belah Grass *P. gracile* and in flooded situations *P. jubiflorum*, *Leptochloa decipiens*, *Enteropogon acicularis*, *Sporobolus scabridus* and *S. caroli* are common associates (Johnson 1984).

Classification of Brigalow communities as endangered reflects the fact that while their individual elements are generally resilient and for the most part in little danger of extinction the integrity of the virgin Brigalow community has virtually disappeared. Brigalow once occupied seven million hectares in Queensland (best estimate 7,020,360ha) (Glanz 1995). Extensive clearing for cropping and pasture of the open forest and woodlands has left only 15% of estimated pre-cleared area and the conservation status is 'Endangered' under the VM Act.

### **Semi-evergreen Vine Thicket**

Famous for its structural complexity and high endemic biodiversity, semi-evergreen vine thickets (SEVT) ecosystems, which may also be

referred to as softwood scrub, Bottle Tree scrub or vine scrub, are a form of dry, seasonal subtropical rainforest, that occur widely across the Brigalow Belt bioregion. There is considerable regional variation in the floristic composition, height and density of the canopy. The thickets typically have an uneven canopy (4–9m high) and contain a mixture of evergreen, semi-evergreen and deciduous emergent tree species (9–18m high). They are also characterised by a prominence of tree species with microphyll-sized leaves (2.5–7.5cm long) and the presence of swollen-stemmed Bottle Trees. Vines, twining or scrambling plants are also prominent.

In the Brigalow Belt bioregion of Queensland there are 15 REs that may be described as SEVT ecosystems. Ten of these REs are listed as part of an endangered ecological community under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act). SEVT ecosystems occur in subtropical areas with a seasonally dry climate (summer average rainfall of 500–750mm per year) and are often associated with elevated, freely drained sites. They are most commonly found on undulating plains over fine-grained sedimentary rocks and on basalt hills and plains on soils of high to medium fertility. They occur less frequently on coastal dunes, Quaternary alluvium, Tertiary clay plains, old loamy and sandy plains, or hills and lowlands on metamorphic rocks. SEVT ecosystems usually occur as discrete patches within other vegetation types, especially Brigalow forest. Many vine thicket remnants are relatively small, with more than half covering less than 20ha (McDonald and Niehus 2001).

SEVT ecosystems rely on a variety of dispersal modes for regeneration and recruitment. The seeds of many canopy emergent species are dispersed by wind, while some seeds of the lower canopy and ground layer species are dispersed by frugivores (fruit-eating animals). SEVT ecosystems are known to be important habitat for frugivorous bird species. They also provide a refuge for wildlife in times of fire and climate change. Fragmentation of SEVT remnants reduces the possibility of species colonising or moving between remnants and may exacerbate the threatening impact of climate change. Increased fragmentation also results in a greater exposure of the edges of SEVT remnants (known as increased edge effects) to environmental conditions, which in



turn can increase the impact of fires and pests (weeds and feral animals) and the potential for salt scald or wind damage.

Key threatening processes to SEVT ecosystems include: land clearing and fragmentation; altered fire regimes; invasion by introduced weeds and pasture species; inappropriate grazing by domestic stock; feral animals; browsing by native animals; salinity; and climate change. Less than 6% of the original extent of these communities is located within protected estate (McDonald and Niehus 2001).

### **Weeping Myall *Acacia pendula* Woodland**

The Weeping Myall Woodlands range from open woodlands to woodlands, are generally 4-12m high, in which Weeping Myall trees are the sole or dominant overstorey species. Weeping Myall trees often occur in monotypic stands, however other vegetation may also occur in the ecological community, though not as dominant species. These include Western Rosewood *Alectryon oleifolius* subsp. *elongates*, Poplar Box, or Black Box *Eucalyptus largiflorens* (Keith 2004; NSW Scientific Committee 2005). Weeping Myall goes through regular cycles of senescence (aging and death) and regeneration. Weeping Myall trees are often lopped for domestic stock fodder. Therefore, the ecological community can be dominated by Weeping Myall trees that are in a living, defoliated or dead state.

The understorey of Weeping Myall Woodlands often includes an open layer of shrubs above an open ground layer of grasses and herbs, though the ecological community can exist naturally either as shrubby or grassy woodland (Beadle 1948; Keith 2004). In many areas, however, the shrub layer has disappeared through overgrazing and dieback events and the woodland now has a primarily grassy understorey (Beadle 1948). The ground layer includes a diversity of grasses and forbs, and varies in species composition and cover depending on past and current grazing regimes, and the occurrence of recent rain (NSW Scientific Committee 2005).

The Weeping Myall Woodlands generally occur on flat areas, shallow depressions or gilgais on raised (relict) alluvial plains. These areas are not associated with active drainage channels and are rarely if ever flooded (White *et al.* 2002;

Keith 2004). The ecological community occurs on black, brown, red-brown or grey clay or clay loam soils. Although the species Weeping Myall occurs widely in Queensland, the Weeping Myall Woodlands ecological community is restricted to small patches that occur within two regional ecosystems in Queensland. These are: 11.3.2 *Eucalyptus populnea* woodland on alluvial plains; and 11.3.28 *Casuarina cristata* ± *Eucalyptus coolabah* open woodland on alluvial plains. Both are categorised as 'Of Concern' under the VM Act.

Small patches of Weeping Myall trees may also occur in Regional Ecosystem 11.9.9a. However, these occurrences are on different landscape and soil types (undulating country on fine grained sedimentary rocks) than the former regional ecosystems which occur on alluvial plains. Accordingly, they are not considered to be part of the listed ecological community. Most of these patches of Weeping Myall Woodlands are less than one to two ha in area.

Lopping for drought fodder and the exclusion of regeneration through continuous grazing have severely degraded the ecological community. However, a beneficial change in grazing management coupled with sufficient rainfall may return the ecological community to good condition relatively easily (Rowe 2002). Regeneration of chenopod species where they have been depleted may also require replanting. Conversely, some changes in land use, such as conversion to long-term cropping, may lead to permanent destruction of the ecological community. Historically the main land-use has been pastoralism with sheep grazing dominating in the east and cattle in the west. However, the higher returns available from wheat and cotton cultivation compared to grazing have, in part, driven extensive clearing in the range of the ecological community over the last three decades (Bedward *et al.* 2001). This trend is continuing and the conversion of sheep grazing to cattle/cropping farming systems is a significant threat to the future recovery of the ecological community.

### **Rock Pavements**

The exposed crests of lateritic ridges often support characteristic plant communities which form shrublands or low open woodlands. Although these communities equate to a single RE, this being 11.7.5, the density and

RE	Management Status1			EPBC Description	Short RE Description (REDD2)
	EPBC Act	VM Act	EP Act		
11.3.39		LC	NC		Silver-leaved Ironbark Eucalyptus melanophloia ± Baradine Red Gum E. chloroclada woodland on undulating plains and valleys with sandy soils
11.4.3	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Brigalow Acacia harpophylla and/or Belah Casuarina cristata shrubby open forest on Cainozoic clay plains
11.4.3a	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Black Tea-tree Melaleuca bracteata woodland fringing swamp associated with Brigalow Acacia harpophylla communities
11.4.7	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Open forest to woodland of Poplar Box Eucalyptus populnea with Brigalow Acacia harpophylla and/or Belah Casuarina cristata on Cainozoic clay plains
11.4.10	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Poplar Box Eucalyptus populnea or Narrow-leaved Box E. pilligaensis, Brigalow Acacia harpophylla, Belah Casuarina cristata open forest to woodland on margins of Cainozoic clay plains
11.4.12		E	E		Poplar Box Eucalyptus populnea woodland on Cainozoic clay plains
11.5.1		LC	NC		Narrow-leaved Red Ironbark Eucalyptus crebra, White Cypress Pine Callitris glaucophylla, Smooth-barked Apple Angophora leiocarpa, Buloke Allocasuarina luehmannii woodland on Cainozoic sand plains and remnant surfaces
11.5.1a		LC	NC		Poplar Box Eucalyptus populnea woodland with Buloke Allocasuarina luehmannii low tree layer on Cainozoic sand plains and remnant surfaces
11.5.4		LC	NC		Narrow-leaved Red Ironbark Eucalyptus crebra, White Cypress Pine Callitris glaucophylla, Black Cypress Pine C. endlicheri, Baradine Red Gum E. chloroclada, Smooth-barked Apple Angophora leiocarpa on Cainozoic sand plains and remnant surfaces on deep sands
11.5.4a		LC	NC		White Cypress Pine Callitris glaucophylla ± Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and remnant surfaces

composition of species, and overall vegetation structure, varies markedly between sites.

Characteristic shrubs include *Acacia triptera*, *Calytrix tetragona*, *Homalocalyx polyandrus*, *Cryptandra armata*, *Prostanthera leichhardtii*, *P. ringens*, *Hakea purpurea* and *Melaleuca uncinata*. *Eucalyptus exserta* is the most common tree which may occur as scattered individuals or form a low open woodland. Other trees occurring on or associated with the margins of rock pavements include *E. panda*, *E. fibrosa*, *Corymbia trachyphloia*, *Allocasuarina inophloia*, *Acacia burrowii*, *A. shirleyi*, *A. aprepta* and *A. sparsiflora*.

Many flora species associated with rock pavements and scalds are virtually confined to that habitat within the Coal Seam Gas tenements. Much of the ground layer flora is ephemeral and responsive to rainfall events.

Rock pavements occur within all of the Coal Seam Gas tenements but are most extensive in the lower Woleebee and upper Carinya and Combabula gas fields. These areas also contain the most diverse shrubland communities and highest numbers of conservation significant and range-restricted species. The structure and species composition of shrublands on rock pavements to the south and east of these tenements is markedly different to those at Gurulmundi.

Conservation significant flora which are associated with rock pavement shrublands include *Micromyrtus carinata*, *Calytrix gurulmundensis* and *Gonocarpus urceolatus*. Within the Coal Seam Gas fields, rock pavements are the most important habitat for these species. Other conservation significant flora species which may occur on the margins of rock pavement shrublands include *Acacia curranii* and *Diuris tricolor*.

Rock pavement shrublands are currently poorly mapped within the Queensland Herbarium state RE mapping. This is largely due to issues with mapping scale, given that many rock pavements cover less than five hectares. In addition, there are numerous examples of important shrublands on rock pavements which have been mapped as non-remnant due to incorrect interpretation of aerial or satellite imagery and lack of ground-truthing. This is particularly so for the Talinga and Dalwogan tenements.

Apart from the rock pavement shrublands in the Gurulmundi area, this habitat has not been well-studied by botanists. Preliminary investigations show a more diverse flora, particularly within the ephemeral ground layer, than is currently realized. With further field work RE 11.7.5 is likely to be further divided into additional sub-REs.

The fauna values of shrublands on rock pavements are largely unknown. There has been no detailed survey for fauna within this habitat, even within well-visited areas such as Gurulmundi. Given the diversity of nectar-producing plants associated with this habitat, the shrublands are likely to support a rich invertebrate fauna.

## H.6.2 HABITAT FOR CONSERVATION SIGNIFICANT FLORA SPECIES

Within the landscape some flora species are naturally rare. Many naturally rare flora species are often associated with naturally restricted habitat types (e.g. rock pavements) or highly specialised life-history traits. More often, species have become Vulnerable or Endangered due to a combination of pressures that impact on their ability to survive and reproduce successfully. These anthropogenic pressures include: clearing vegetation; erosion caused by clearing; salinity; introduction of exotic or weed species; introduction of exotic herbivores (e.g. rabbits); changes in burning regimes; changes to native faunal species densities (e.g. watering points for kangaroos); and climate change.

Within BBS there are 61 threatened plant species (including one extinct species, *Amphibromus whitei*). Habitat for threatened plant species often occurs within vegetation communities that are themselves threatened through clearing or degradation. Targeted clearing of vegetation on fertile soils has led to the disproportionate decrease in populations of flora species endemic to these soils, for example Ooline and Queensland White Gum within BBS (Cogger *et al.* 2003).

Conservation of threatened species requires intimate knowledge of the autecology of the species and identification of the potential threats to its long-term survival (Leverington and Playford 2001).

## H.7 FAUNA

It is important to consider fauna and their requirements and conservation at a landscape scale due to their dispersive abilities. This is particularly the case for birds, with approximately 50% of Australia's land and freshwater birds known to undertake large scale or migratory movements (Gilmore *et al.* 2007). Long-distance movements are vital to continued survival of many species that are core components of Australia's biota. Successful conservation, therefore, must encompass management of resources that facilitate movement across the landscape (Recher 2007). Wide-ranging species are especially at risk to incremental loss of habitat as the importance of a particular piece of habitat may be dismissed on the assumption that there is sufficient habitat elsewhere in their range (Saunders *et al.* 2007).

### H.7.1 FAUNAL HABITAT QUALITY

Vegetation mapped as remnant may vary substantially in terms of its value for fauna, even for patches of the same RE. This is because the mapping most accurately reflects the canopy and may not identify disturbance regimes which affect other habitat components. A patch may be disturbed by weeds, inappropriate fire regimes and grazing by livestock (Hannah and Thurgate 2001; Wilson and Neldner 2001). Grazing may result in soil compaction and trampling of vegetation and micro-habitats and both livestock and fire may inhibit recruitment of trees and shrubs. Small patches are typically occupied by a fauna species assemblage composed of disturbance tolerant generalist species (Hannah and Thurgate 2001).

The presence of reptiles, for example, is largely driven by micro-habitats such as fallen timber, especially hollow logs, leaf litter, rocks and rock outcrops, soil cracks, loose soil, low-lying shrubs and tussocks, exfoliating bark, both standing and fallen, small hollow tree limbs, spider holes and other animal burrows (Hannah and Thurgate 2001; Richardson 2006).

### H.7.2 MATRIX HABITAT

The Study Area has undergone substantial clearing which has fragmented original habitats into patches of varying sizes. These patches are surrounded by highly modified habitats, often pasture, which are now unlike the original

land cover and form what is called a matrix landscape (Wilcove *et al.* 1986). The effect of this landscape heterogeneity on the movement of fauna is poorly understood as corridors for movement can be difficult to identify when the landscape matrix is composed of different land cover types. Corridors are often diffuse and difficult to identify from structural features of the landscape (Gustafson and Gardner 1996). The matrix does, nonetheless, provide habitat for fauna. Even patches too small to maintain viable populations or to provide sufficient breeding resources may provide foraging opportunities on a daily basis or be used as stepping stones by which species, particularly birds, move through the landscape (Fischer and Lindenmayer 2002a).

Only 2.1% of the Brigalow Belt bioregion is in major conservation reserves and the vegetation types that have undergone most of the historical and more recent clearing, Brigalow, softwood scrubs, grasslands and alluvial vegetation types are more fragmented and less well represented in conservation reserves than eucalypt woodlands and vegetation communities on ranges (Wilson and Neldner 2001). Almost 12% of land in Australia is protected but much of this land is nutrient poor and elevated and is not representative of much of the landscape (Kingsford *et al.* 2009), a situation which is consistent with the Study Area. Remaining patches of the heavily cleared habitats still play an important role in maintaining the fauna assemblage of an area. For example, one study in BBS of a matrix of Brigalow remnants, croplands and grasslands found that 44% of bird species recorded were only found in Brigalow remnants (Collard *et al.* 2009).

Given the non-random clearing of vegetation (Norton *et al.* 1995; Seabloom *et al.* 2002), small patches may be in more productive areas than large patches (Fischer and Lindenmayer 2002b) and are important for local and regional biodiversity conservation in agricultural landscapes (Collard *et al.* 2009: 1650). However, there may be substantial differences between regions. For example, Fischer and Lindenmayer (2002b) studied two different landscapes and recorded 37% and 75% of possible bird species in habitat patches less than one ha, respectively. The long-term viability of faunal use of any patch is strongly influenced by its location within the landscape, particularly in regard to corridors, and by the nature of surrounding vegetation and land-uses



(Norton *et al.* 1995). Additional factors, such as the presence or absence of Noisy Miners, also influence their habitat value (Fischer and Lindenmayer 2002a).

Even thin, non-remnant patches within the landscape may play a valuable role for certain species. Mistletoes, an important food resource, have higher rates of water use than their host and can be more abundant along road edges than on host plants of the same species away from the road edge. Not all roadside corridors have mistletoe, however, presumably due to the corridor being unsuitable for bird species that disperse mistletoe or such species not using the corridor in a fashion that sustains mistletoe populations (Norton *et al.* 1995).

### H.7.3 REGROWTH

There are substantial areas of non-remnant or disturbed vegetation in the Brigalow Belt (Wilson and Neldner 2001). Much of this vegetation is regrowth, which is typically an unplanned consequence of land-use and is regarded by most landholders as a nuisance when in pasture (Anderson 1984; Bowen *et al.* 2009).

The value of regrowth to vertebrate fauna has been little studied, and that published has an overwhelming emphasis on birds. Regrowth has been shown to support a greater species assemblage than cleared land but less than woodland areas (Hannah *et al.* 2007). Regrowth often lacks fallen timber, leaf litter and complex vertical structure (Bowen *et al.* 2009) and not surprisingly, the value of regrowth to fauna is generally dependent on its age, with older regrowth providing greater resources. Old regrowth has developed a more 'tree-like' structure and typically supports more species and a greater abundance of species (Kutt 1997; Bowen *et al.* 2009).

In Brigalow, fruit and nectar producing plants are patchily distributed and are rare in regrowth which consequently is better able to support insectivorous species. Insectivorous species, in turn, are influenced by the age of the regrowth, the level of grazing disturbance and the abundance of aggressive miners (Bowen *et al.* 2009). Other factors, however, may affect the value of regrowth patches. Younger regrowth in more productive parts of the landscape or areas that have regrown around remnant trees may have values for fauna greater than some older

regrowth (Taylor *et al.* 1997). Some fauna species, including regionally significant species, appear to actually favour regrowth in some areas (Dorricott *et al.* 1997).

Although the number of species in regrowth may be less than in remnant vegetation it may still support a substantial number of species, for example regrowth in central Queensland had 75% of the species richness of woodlands (Hannah *et al.* 2007). Regrowth does increase the amount of wooded habitat in the landscape and can buffer adjacent remnant vegetation from many edge effects (Mesquita *et al.* 1999; Laurance *et al.* 2001).

### H.7.4 PADDOCKS TREES

Another part of a landscape matrix is scattered trees or 'paddock trees' which provide foraging, roosting and breeding habitat for fauna, increase structural complexity, act as focal points for ecosystem restoration through the dispersal of viable seeds by frugivorous birds, increase soil fertility through redistribution of nutrients, and by acting as 'stepping stones' increase landscape connectivity. They have a disproportionate influence on their surroundings and increase the utility of an area to a number of species, particularly micro-bats and birds. Although they should not be seen as a substitute for forested patches and corridors they do play a complementary role (Cunningham *et al.* 2008; Manning *et al.* 2006; Manning and Lindenmayer 2009).

## H.8 CONSERVATION OF VEGETATION COMMUNITIES - STATE-FORESTS, NATIONAL PARKS AND CONSERVATION RESERVES

The only natural area reserve located within the Study Area is the Chinchilla Rifle Range Nature Reserve, located within the Talinga–Orana tenement. Apart from this reserve there is one Resource Reserve and 23 state forests protected under the *Forestry Act 1959* for their timber reserves. These areas are grazed by cattle. Due to requirements under the provisions of the *Land Protection (Pest and Stock Route Management) Act 2002*, weeds and feral animals are actively controlled within these areas.

The highly fragmented nature of the remnant vegetation within the local area means that conservation options, particularly reservation,

are now constrained and must chiefly rely upon community engagement in protecting remnants and re-establishing heavily cleared ecosystems, including the encouragement of regrowth in critical sites. All remnant vegetation, particularly on the clay plains and within alluvial systems, is an urgent priority for protection for biodiversity conservation and the maintenance of ecosystem services. A large part of this bioregion is within the headwaters of the upper Murray-Darling Basin where extensive salinity is occurring and the maintenance of remnant vegetation is important to maintain landscape water balance.

## **H.9 BIODIVERSITY AND ECOSYSTEM FUNCTION**

### **H.9.1 BIODIVERSITY AND ECOSYSTEM FUNCTION**

Natural landscape components maintain biodiversity, providing critical ecosystem services through complex interactions between a diverse array of biotic and abiotic ecosystem components (Tilman and Downing 1994; Daily 1997; Matson *et al.* 1997; Tilman 1997; Altieri 1999; Tscharntke *et al.* 2002; Swift *et al.* 2004; Fischer *et al.* 2006). With the exception of some conjecture as to redundancy in biodiversity (Lawton and Brown 1993; Doherty 1998; Fonseca and Ganade 2001), ecosystem functioning and resilience is proposed to increase with increasing biodiversity, especially at larger spatial scales (Holling 1973; Vitousek and Hooper 1994; Bond and Chase 2002; Bengtsson *et al.* 2003; Loreau *et al.* 2003). Human-induced changes to this biodiversity can alter ecosystem properties potentially affecting ecosystem function and the goods and services that ecosystems provide to human communities (Hooper *et al.* 2005; Tschaarntke *et al.* 2005).

In general, disturbance and fragmentation of ecological communities caused by human mediated disturbance to native vegetation disrupts biophysical processes and ecological function leading to loss of biological diversity, land degradation and degraded ecosystem services (Saunders *et al.* 1991; Bird 1992; Catterall and Kingston 1993; Hobbs 1993a; McLaughlin and Mineau 1995; Tilman 1996; Matson *et al.* 1997; Altieri 1999; Brown *et al.* 2000; Swift *et al.* 2004; Tscharntke *et al.* 2002; Tscharntke *et al.* 2005). Efforts to conserve biodiversity and to maintain ecosystem services in agro-ecosystems need to consider ecological communities and the processes affecting them,

at a range of spatial scales (Baudry *et al.* 2000; Swift *et al.* 2004; Collard 2007). In particular the spatial patterning of landscape elements may affect biophysical ecosystem processes (Lambeck 1997, Freudenberg 1999) and thus influence ecological function (Weibull *et al.* 2003).

The thresholds that govern ecological integrity at the landscape scale relate to habitat loss per se, while at the patch scale fragmentation parameters are important (McAlpine *et al.* 2002; Lindenmayer and Luck 2005). Threshold theory has suggested that somewhere between 10–30% remaining native vegetation cover there is acceleration in species loss (Andren 1994; McAlpine *et al.* 2002). Many researchers have proposed that these estimates are naïve (Lindenmayer and Luck 2005), especially as the most productive parts of the landscape are often cleared first (Woolley and Kirkpatrick 1999). The condition of remaining vegetation is often compromised (Fleishman *et al.* 2002) and the viability of populations may take decades to resolve (Saunders *et al.* 1991) masking the effects of clearing.

This ecological theory is reflected in the Queensland State government's policies on ecosystem protection. The *Vegetation Management Act 1999* affords a level of protection to remnant native vegetation communities on a given land zone according to the percentage of pre-clear area remaining within the bioregion. Those communities of which only 10% of its pre-clear extent remains are endangered, whilst those of which between 10 and 30% still remains are Of Concern and those communities with greater than 30% of their pre-clear extent remaining are Least Concern. Factors that consistently degrade condition of communities are reflected in DERM's Biodiversity Status, the conservation of particular REs are raised if known factors are consistently degrading the condition of a particular community across the bioregion.

In this instance the current project will remove remnant and non-remnant native vegetation and attempt to offset these impacts by the protection and active regeneration of disturbed communities. In addition, activities may increase or decrease the condition of remaining and revegetating vegetation patches. The amount, spatial pattern, contextual location and proportions of the extant vegetation communities that are disturbed and



rehabilitated will dictate the losses, gains and functional capacity of biodiversity throughout the region over the life of the project (Matson *et al.* 1997).

Extant patches of remnant native vegetation in agro-ecosystems such as the present Study Area are typically small, highly fragmented and isolated from other similar patches by large expanses of agricultural land (Andren 1994; Forman and Godrun 1995). Despite their small size and modified condition, the remaining small patches provide an important refuge for remaining biodiversity (Catterall *et al.* 1991; Saunders *et al.* 1991; Barret *et al.* 1994; Lindenmayer *et al.* 1999; Fischer and Lindenmayer 2002a; Tschardt *et al.* 2002). In general, in this landscape, species richness declines in patches less than five hectares (Collard 2007). Indeed McIntyre *et al.* (2000) suggest that woodland patches of at least five to 10ha are required to support the majority of plant and vertebrate animal species in grassy woodlands within south-east Queensland.

In addition to size *per se*, the geographical relationship of a patch to other patches also influences its biodiversity (Saunders and Hobbs 1991; Bender *et al.* 1998; Lindenmayer *et al.* 1999; DNR 2001; Land and Water Australia 2005) whilst characteristics of neighbouring non-native and regrowth type (matrix quality) (Pearson 1993; Carroll *et al.* 2004; Bender and Fahrig 2005; Brotons *et al.* 2005; Martin *et al.* 2006) may have a significant influence on local biodiversity and wider-scale ecosystem function (Lindenmayer *et al.* 1999).

In summary, total areal coverage of different native vegetation communities mediated by the effects of habitat complexity, landscape context matrix type and patch size and shape are commonly used to indicate ecosystem function (Saunders *et al.* 1998; Nagendra and Gadgil 1999; Andreasen *et al.* 2001; Bastin *et al.* 2002; Ferrier 2002).

## **H.9.2 REGROWTH AND VEGETATION COMMUNITY RECOVERY**

Habitat loss and fragmentation are recognised as major threats to global biodiversity (Pimm and Raven 2000; Fahrig 2001, 2002, 2003). Management and recovery of biodiversity in regrowth forests is an important measure in offsetting losses due to anthropogenic disturbances. The importance of regrowth areas to the maintenance of biodiversity will be

proportional to the amount of the vegetation type already fully cleared or otherwise irrevocably developed (Doherty 1998). In general, the ecological values of regrowth forest are likely to depend on the land use history and landscape context (Bowen *et al.* 2007).

The regeneration pathways of regrowth are difficult to predict and are strongly dependent on the land use history, including the type, duration and intensity of land management (Uhl *et al.* 1988; Doherty 1998; Mesquita *et al.* 2001; Chazdon 2003; Pereira *et al.* 2003; Collard and Zammit 2006). Moreover the landscape context can add a further dimension of variability to regeneration pathways with proximity to mature forest being a particularly important determinant of the diversity of seeds capable of dispersing into regenerating areas (Matlack 1994; Wijdeven and Kuzee 2000; Debus 2009). With regrowth forests regularly including exotic plant species not typically present in mature forests (Lugo and Helmer 2004), even after 100-150 years of regeneration the floristic composition and structure of regrowth forests often differ considerably from mature forests (Turner *et al.* 1997; Foster *et al.* 1998; Bowen *et al.* 2007).

Brigalow, one of the most threatened ecological communities within the broader area is notable for its ability to persist in the environment (Bailey 1984). The persistence of Brigalow vegetation is due to its capacity to sucker (Isbell 1962; Johnson 1964; Coaldrake 1970; Johnson 1981; Anderson 1984; Fossett and Venamore 1993; Nix 1994). In terms of regrowth development, the average growth rate of Brigalow suckers has been measured at approximately 30cm in height each year over the first 5-10 years, with growth being particularly rapid in the early stages (Johnson 1964). The growth rate of Brigalow tends to slow down after 10-15 years, being extremely slow from 20 years onwards. Brigalow vegetation has a recognised tendency to develop extensive horizontal root systems, typical of trees in environments where there is no access the groundwater table (West *et al.* 1999). Johnson (1964) observed lateral roots in the upper 90cm of the soil profile, being well developed in the top 30cm. Tunstall and Connor (1981) completed a hydrological study of a mature Brigalow community and found that most of the soil water fluctuations underneath Brigalow trees occurred in the top one metre section of the soil.

### **H.9.3 DESIGNING OFFSETS TO MAXIMISE BIODIVERSITY BENEFITS**

Decisions about where to place offsets (revegetated areas) have profound consequences for determining ecosystem health at both small (10s to 100s of hectares) and large (1000s to millions of hectares) spatial scales. Restoration at small spatial scales, (that may include revegetation, buffering of habitats, and pest management) is essential, however across a Study Area of 1.5 million ha, a more co-ordinated approach must be taken, such that functioning landscapes are restored and maintained (Vesk and MacNally 2005; Lindenmayer *et al.* 2007). It is important to take into account numerous factors when making decisions about the suitability of offsets. Inevitably there is a time-lag between when an area is revegetated and when it becomes fully functional in terms of ecosystem processes.

However a number of strategies can be applied to maximize the effectiveness of revegetation programs in both a spatial and temporal framework. These include maximizing contiguous areas of habitat (Bennett and MacNally 2004), applying planting strategies that most rapidly create habitat for fauna species (e.g. spacing trees widely produces shorter, more massive trees that have more hollows and more fallen timber) (Vesk and MacNally 2005), and revegetating agriculturally productive (and hence under-represented) sites. Methods that employ species-based approaches for choosing among alternative patches may also provide a useful layer of information on which to base decisions (Margules *et al.* 1988).

An integrated modelling approach that incorporates these and a multitude of other issues, such as connectivity and disturbance regimes, is essential to plan and assess alternative revegetation and restoration programs such that both species and ecosystems are managed at multiple geographic scales (Possingham *et al.* 2001, Lindenmayer *et al.* 2007).

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RE	Management Status1			EPBC Description	Short RE Description (REDD2)
	EPBC Act	VM Act	EP Act		
11.5.5		LC4	NC		Silver-leaved Ironbark Eucalyptus melanophloia, White Cypress Pine Callitris glaucophylla woodland on Cainozoic sand plains and remnant surfaces with deep sands
11.5.20		LC	NC		Gum-topped Box Eucalyptus moluccana and/or Inland Grey Box E. microcarpa / Narrow-leaved Box E. pilligaensis ± Narrow-leaved Red Ironbark Eucalyptus crebra woodland on Cainozoic sand plains
11.5.21		LC	NC		Bloxsome's Yellow Bloodwood Corymbia blosomei ± White Cypress Pine Callitris glaucophylla ± Narrow-leaved Red Ironbark Eucalyptus crebra ± Smooth-barked Apple Angophora leiocarpa woodland on Cainozoic sand plains and remnant surfaces
11.7.1		LC	OC		Brigalow Acacia harpophylla and/or Belah Casuarina cristata and Mountain Yapunyah Eucalyptus thozetiana or Inland Grey Box E. microcarpa woodland on lower scarp slopes on lateritic duricrust
11.7.2		LC	NC		Acacia spp. woodland on lateritic duricrust in scarp retreat zone
11.7.4		LC	NC		Gum-topped Ironbark Eucalyptus decorticans and/or Eucalyptus spp., Corymbia spp., Acacia spp., Budgeroo Lysicarpus angustifolius on lateritic duricrust
11.7.4c		LC	NC		Gum-topped Ironbark Eucalyptus decorticans ± Eucalyptus spp. ± Acacia spp. on low hills and ranges with shallow soils
11.7.5		LC	NC		Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks
11.7.6		LC	NC		Spotted Gum Corymbia citriodora subsp. variegata or Narrow-leaved Red Ironbark Eucalyptus crebra woodland on lateritic duricrust
11.7.7		LC	NC		Tall Dusky-leaved Ironbark E. fibrosa ssp. nubila ± Corymbia spp. ± Eucalyptus spp. on lateritic duricrust
11.8.3	E	OC	OC	Semi-evergreen Vine Thickets (SEVTs) of the Brigalow Belt	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides

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**Appendix I:**  
**Refined Vegetation Mapping from the Current Assessment**

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Managing Director

RE	Management Status1			EPBC Description	Short RE Description (REDD2)
	EPBC Act	VM Act	EP Act		
				(North and South) and Nandewar Bioregions	
11.9.1	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Brigalow Acacia harpophylla - Dawson Gum E. cambageana open forest to woodland on fine-grained sedimentary rocks
11.9.4a	E	OC	E	Semi-evergreen Vine Thickets (SEVTs) of the Brigalow Belt (North and South) and Nandewar Bioregions	Semi-evergreen vine thickets (SEVT) on steep upper and middle slopes where heavy clay soils form
11.9.4b	E	OC	E	Semi-evergreen Vine Thickets (SEVTs) of the Brigalow Belt (North and South) and Nandewar Bioregions	Brigalow Acacia harpophylla + Semi-evergreen Vine Thicket (SEVT) that occur on undulating plains and rises
11.9.5	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Brigalow Acacia harpophylla and/or Belah Casuarina cristata open forest on fine-grained sedimentary rocks
11.9.6	E	E	E	Brigalow (Acacia harpophylla dominant and co-dominant)	Myall Acacia melvillei ± Brigalow Acacia harpophylla open forest on fine-grained sedimentary rocks
11.9.7		OC	OC		Poplar Box Eucalyptus populnea, False Sandalwood Eremophila mitchellii, shrubby woodland on fine-grained sedimentary rocks
11.9.9		LC	NC		Narrow-leaved Red Ironbark Eucalyptus crebra woodland on fine-grained sedimentary rocks
11.9.10		OC	E		Brigalow Acacia harpophylla and Poplar Box Eucalyptus populnea open forest on fine-grained

# **APPENDIX I**

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

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

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Australia Pacific LNG Project EIS  
for Worley Parsons on behalf of Australia Pacific LNG

RE	Management Status <sup>1</sup>			EPBC Description	Short RE Description (REDD2)
	EPBC Act	VM Act	EP Act		
					sedimentary rocks
11.10.1		LC	NC		Spotted Gum <i>Corymbia citriodora</i> subsp. <i>variegata</i> open forest on coarse-grained sedimentary rocks
11.10.1d		LC	NC		Narrow-leaved Red Ironbark <i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks
11.10.3		LC	NC		Bendee <i>Acacia catenulata</i> or Lancewood <i>A. shirleyi</i> open forest on coarse-grained sedimentary rocks, crests and scarps
11.10.7		LC	NC		Narrow-leaved Red Ironbark <i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks
11.10.9		LC	NC		White Cypress Pine <i>Callitris glaucophylla</i> woodland on coarse-grained sedimentary rocks
11.10.11		LC	NC		Poplar Box <i>Eucalyptus populnea</i> , Silver-leaved Ironbark <i>E. melanophloia</i> ± White Cypress Pine <i>Callitris glaucophylla</i> woodland on coarse-grained sedimentary rocks
11.10.13		LC	NC		<i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. open forest on scarps and sandstone tablelands

<sup>1</sup> Where: E = Endangered, OC = Of Concern, LC = Least Concern, NC = No Concern at Present, \* = Threshold (at risk of becoming OC). 'EP Act' status is based on the 'Biodiversity Status' prescribed on DERM's Regional Ecosystem Description Database v6.

<sup>2</sup> REDD = DERM's Regional Ecosystem Description Database v6.

<sup>3</sup> Only where Weeping Myall *Acacia pendula* occurs.

<sup>4</sup> 'Threshold' REs that are at risk of the remnant extent falling below 30% of its preclearing extent, or having a remnant extent of less than 10 000ha (DERM 2009b).



**Table 2.4. Extent of REs within the Relevant Provinces and Study Area identified on 1:100,000 RE mapping (DERM 2009a)**

RE	Management Status1			Total Current Extent in Relevant Provinces2,3		Extent Protected under the NC Act in Relevant Provinces2,3,4	Extent in Study Area5	Extent in Tenements5
	EPBC Act	VM Act	EP Act	Ha (% of preclearing extent)	Extent-based Status within the Relevant Provinces Context6			
11.3.1	E	E	E	3111 (2.3)	E	1 (0.03)	564 (18.12)	187 (6.01)
11.3.2	E7	OC	OC	167893 (20.03)	OC	1207 (0.72)	12458 (7.42)	4498 (2.68)
11.3.3		OC	OC	11335 (12.30)	OC	0 (0)	761 (6.72)	292 (2.58)
11.3.4		OC	OC	14666 (14.96)	OC	43 (0.29)	2424 (16.53)	755 (5.15)
11.3.14		LC	NC	60647 (82.29)	LC	0 (0)	10703 (17.65)	8315 (13.71)
11.3.17		OC	E	4347 (6.01)	E	0 (0)	81 (1.87)	37 (0.85)
11.3.18		LC	NC	30093 (42.08)	LC	2102 (6.99)	3080 (10.23)	1112 (3.7)
11.3.19		LC	NC	29242 (50.59)	LC	0 (0)	1771 (6.06)	10 (0.03)
11.3.25		LC	OC	111637 (56.94)	LC	221 (0.20)	21203 (18.99)	8655 (7.75)
11.3.26		LC	NC	13261 (43.36)	LC	0 (0)	83 (0.62)	2 (0.01)
11.3.27b		LC	OC	3153 (55.16)	LC	442 (14.02)	45 (1.42)	n/a9
11.3.39		LC	NC	11121 (50.05)	LC	422 (3.79)	889 (7.99)	n/a9
11.4.3	E	E	E	32277 (4.78)	E	768 (2.38)	3733 (11.57)	1371 (4.25)
11.4.3a	E	E	E					

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RE	Management Status1			Total Current Extent in Relevant Provinces2,3		Extent Protected under the NC Act in Relevant Provinces2,3,4	Extent in Study Area5	Extent in Tenements5
	EPBC Act	VM Act	EP Act	Ha (% of preclearing extent)	Extent-based Status within the Relevant Provinces Context6			
11.4.7	E	E	E	3063 (16.22)	OC	130 (4.24)	256 (8.37)	41 (1.33)
11.4.10	E	E	E	1589 (6.52)	E	0 (0)	59 (3.70)	36 (2.29)
11.4.12		E	E	4337 (8.65)	E	0 (0)	1099 (25.33)	606 (13.98)
11.5.1		LC	NC	440592 (63.19)	LC	46 (0.01)	165792 (37.63)	81587 (18.52)
11.5.1a		LC	NC					
11.5.4		LC	NC	85052 (83.24)	LC	1677 (1.97)	29230 (34.37)	16590 (19.51)
11.5.4a		LC	NC					
11.5.5		LC8	NC	83461 (39.16)	LC	77 (0.09)	17912 (21.46)	5530 (6.63)
11.5.20		LC	NC	82777 (65.10)	LC	240 (0.29)	15377 (18.58)	4346 (5.25)
11.5.21		LC	NC	72026 (94.21)	LC	0 (0)	4014 (5.57)	2 (<0.01)
11.7.1		LC	OC	39923 (32.90)	LC	1740 (4.36)	2281 (5.71)	930 (2.33)
11.7.2		LC	NC	34901 (46.82)	LC	0 (0)	9899 (28.36)	6134 (17.58)
11.7.4		LC	NC	174688 (69.32)	LC	1197 (0.69)	70810 (40.53)	24492 (14.02)
11.7.4c		LC	NC					
11.7.5		LC	NC	52009 (86.83)	LC	920 (1.77)	14820 (28.49)	3465 (6.66)

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RE	Management Status1			Total Current Extent in Relevant Provinces2,3		Extent Protected under the NC Act in Relevant Provinces2,3,4	Extent in Study Area5	Extent in Tenements5
	EPBC Act	VM Act	EP Act	Ha (% of preclearing extent)	Extent-based Status within the Relevant Provinces Context6			
11.7.6		LC	NC	178711 (86.13)	LC	554 (0.31)	23492 (13.15)	3507 (1.96)
11.7.7		LC	NC	164202 (86.28)	LC	133 (0.08)	50551 (30.79)	24918 (15.17)
11.8.3	E	OC	OC	11033 (26.16)	OC	1956 (17.73)	8 (0.07)	n/a9
11.9.1	E	E	E	3893 (4.66)	E	0 (0)	7 (0.18)	n/a9
11.9.4a	E	OC	E					
11.9.4b	E	OC	E	11043 (16.84)	OC	32 (0.29)	1433 (12.97)	177 (1.61)
11.9.5	E	E	E	76647 (5.27)	E	1091 (1.42)	9738 (12.70)	3898 (5.09)
11.9.6	E	E	E	371 (2.42)	E	0 (0)	117 (31.66)	n/a9
11.9.7		OC	OC	53614(14.63)	OC	0 (0)	1819 (3.39)	82 (0.15)
11.9.9		LC	NC	31101 (37.41)	LC	107 (0.34)	758 (2.44)	n/a9
11.9.10		OC	E	50454 (12.96)	OC	2470 (4.90)	2600 (5.15)	1025 (2.03)
11.10.1		LC	NC					
11.10.1d		LC	NC	134467 (74.90)	LC	233 (0.17)	30447 (22.64)	3200 (2.38)
11.10.3		LC	NC	72013 (97.58)	LC	15559 (21.61)	149 (0.21)	n/a9
11.10.7		LC	NC	123880 (84.23)	LC	3127 (2.52)	2752 (2.22)	n/a9

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RE	Management Status <sup>1</sup>			Total Current Extent in Relevant Provinces <sup>2,3</sup>		Extent Protected under the NC Act in Relevant Provinces <sup>2,3,4</sup>	Extent in Study Area <sup>5</sup>	Extent in Tenements <sup>5</sup>
	EPBC Act	VM Act	EP Act	Ha (% of preclearing extent)	Extent-based Status within the Relevant Provinces Context <sup>6</sup>			
11.10.9		LC	NC	86194 (54.43)	LC	840 (0.97)	14934 (17.33)	6988 (8.11)
11.10.11		LC	NC	123513 (45.86)	LC	8081 (6.54)	6788 (5.5)	2472 (2.00)
11.10.13		LC	NC	186936 (98.48)	LC	53392 (28.56)	208 (0.11)	n/a <sup>9</sup>

<sup>1</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>2</sup> 'Relevant Provinces' includes provinces 25, 26, 27, 28, 30, 31 and 32 of the BBS bioregion, except REs 11.10.3, 11.10.7, and 11.10.13 (for which the Relevant Province is province 24).

<sup>3</sup> Based on data from EPA (2008d). Data is only available for each RE as a whole, not for individual subsets (for example, for 11.4.3, not for 11.4.3a).

<sup>4</sup> Areas protected under the NC Act include National Parks, Conservation Parks, Forest Reserves, Resource Reserves and Nature Refuges, based on data from EPA (2008d).

<sup>5</sup> Based on GIS analysis of certified 1:100,000 RE mapping (DERM 2009a).

<sup>6</sup> Based on the VM Act status criteria, where: E = <10% of preclearing extent remaining, OC = 10-30% of preclearing extent remaining, and LC = >30% of preclearing extent remaining.

<sup>7</sup> Only where Weeping Myall *Acacia pendula* occurs.

<sup>8</sup> 'Threshold' REs that are at risk of the remnant extent falling below 30% of its preclearing extent, or having a remnant extent of less than 10 000ha (DERM 2009b).

<sup>9</sup> REs not mapped within the gas field tenements.

Generally, the extent of RE clearing within the Relevant Provinces is similar to that within the BBS bioregion. That is, less than 10% of the preclearing extent of endangered REs still persists within the Relevant Provinces, less than 30% persists for of concern and greater than 30% persists for least concern REs. Notable exceptions include:

RE 11.3.17: listed as of concern within the bioregion (that is, between 10 and 30% of the preclearing extent remains) but only 6% of the preclearing extent of this RE remains within the Relevant Provinces, making this community locally endangered. This RE is particularly under-represented within the study area with only 82ha or less than 1.9% of the total extent within the relevant provinces.

RE 11.4.7: listed as endangered at the bioregional level (that is, <10% of the preclearing extent remains) but 16% of the preclearing extent remains within the relevant provinces, making it locally of concern.

Endangered REs 11.9.6 and 11.3.1 are highly threatened locally with only 2% remaining within the Relevant Provinces, none of which is protected within a significant area under the NC Act. In the case of RE 11.9.6, about one third of the 2% remaining occurs within the study area, making it a locally important area for the persistence of this RE.

Similarly, a high proportion of the current extent of least concern REs 11.7.4 /11.7.4c (41%) and RE 11.7.5 (28%) within the Relevant Provinces is located within the study area. This is particularly notable for RE 11.7.5 which is known to contain locally endemic threatened flora species, making it a very important refuge for these species at a local level.

Table 2.4 also indicates that all of the remnant vegetation communities within the study area are poorly conserved within areas protected under the NC Act. Less than 7% of any given RE is located within an area protected under the NC Act when considered in the context of the Relevant Provinces. The four exceptions –

freshwater wetlands (RE 11.3.27), semi-evergreen vine thicket (SEVT) (RE 11.8.3), Acacia open forest on crests and scarps (RE 11.10.3) and Eucalypt open forest on scarps and tablelands (RE 11.10.13), with 14%, 18%, 22% and 29% conserved, respectively – are among the most under-represented REs in the context of the Relevant Provinces.

### ***Certified Mapping of High-value Regrowth Vegetation***

On 7 October 2009, the Queensland Government's moratorium on clearing high-value regrowth vegetation was replaced by the Vegetation Management and Other Legislation Bill 2009 protecting regrowth and its biodiversity values. According to the new laws, 'high-value regrowth vegetation' is mature native vegetation that hasn't been cleared since 31 December 1989, but which is not currently recognised as remnant vegetation.

High-value regrowth vegetation currently mapped for the wetlands (RE 11.3.27) and 18% of semi-evergreen vine thicket (SEVT) (RE 11.8.3) is included on the existing RE mapping in Appendix F. A refined assessment of regrowth vegetation is discussed in Section 2.3.2, based on the results of the 2009 ground surveys and the subsequent mapping exercise.

### ***State-listed Wetlands***

Mapping layers obtained from DERM indicate that no area listed under the Queensland Directory of Important Wetlands occurs within the study area.

### ***Existing Significant Species Data***

A search of WildNet records (DERM 2009c,d) (provided in Appendix G) and a review of unpublished data accessed for the assessment (Craig Eddie pers. comm., Boobook Ecological Consulting 2009) indicates that at least 49 terrestrial flora species of special conservation significance have been previously recorded within the study area, including 20 species listed as threatened under the EPBC Act, 38 listed as endangered, vulnerable, rare or near



threatened species under the NC Act and eight listed as non-EVR priority species for the BBS bioregion (EPA 2008b). These species are discussed in Section 2.3.2, following consideration of the findings of the recent ground surveys and vegetation mapping refinements.

### **Literature Review**

The literature review presented in Appendix H contains a summary of published information regarding vegetation communities and flora species from within the study area. Where necessary, this information has been used to inform the subsequent, refined assessments of terrestrial flora values in Section 2.3.2 and the impact assessment in Section 3.0.

#### **1.5.2 2009 Ground Surveys and Subsequent Mapping and Information Refinements**

A description of the methodology employed for the surveys of terrestrial flora species and vegetation communities undertaken for the current assessment is provided in Appendix A. The following is a description of terrestrial flora communities and species recorded during the surveys, or considered likely to occur based on the findings of the surveys, including a refinement of the results provided in Section 2.3.1, as necessary.

#### **Terrestrial Vegetation Communities**

Refined terrestrial vegetation mapping from the current assessment is shown on Figures 2.6 to 2.8 and at a finer scale in Appendix I. An indicative comparison of the extent of each RE within the study area based on the 1:100,000 DERM certified RE mapping versus the refined mapping is provided in Table 2.5, along with general comments on the condition of each community based on field observations. As for Table 2.4 in Section 2.3.1 the extent of REs remaining within the study area has been expressed as a percentage of that within the Relevant Provinces to highlight those REs

under most threat from disturbance within the study area.

Major differences between the refined vegetation mapping layer shown in Appendix I and that of the certified 1:100,000 RE mapping (Version 6) in Appendix F are as follows:

Approximately 36,000 additional hectares of remnant vegetation were mapped, representing an increase of 7%.

Riparian areas occurring on alluvial soils mapped as REs 11.3.2, 11.3.14, and 11.3.25 have increased by 18%, 18% and 17%, respectively. These increases are a direct result of increased mapping scale leading to the mapping of vegetation communities previously too narrow to be mapped under 1:100,000 mapping rules (Neldner *et al.* 2005).

The increase in REs 11.3.1, 11.4.3 and 11.9.5 by 40%, 28% and 12% is the result of mapping stands and shade lines of brigalow previously too small to be mapped under 1:100,000 mapping rules (Neldner *et al.* 2005).

The increase in REs 11.9.7 and 11.9.10 by 31% and 21% is the result of mapping stands and shade lines of Poplar Box previously too small to be mapped under 1:100,000 mapping rules (Neldner *et al.* 2005).

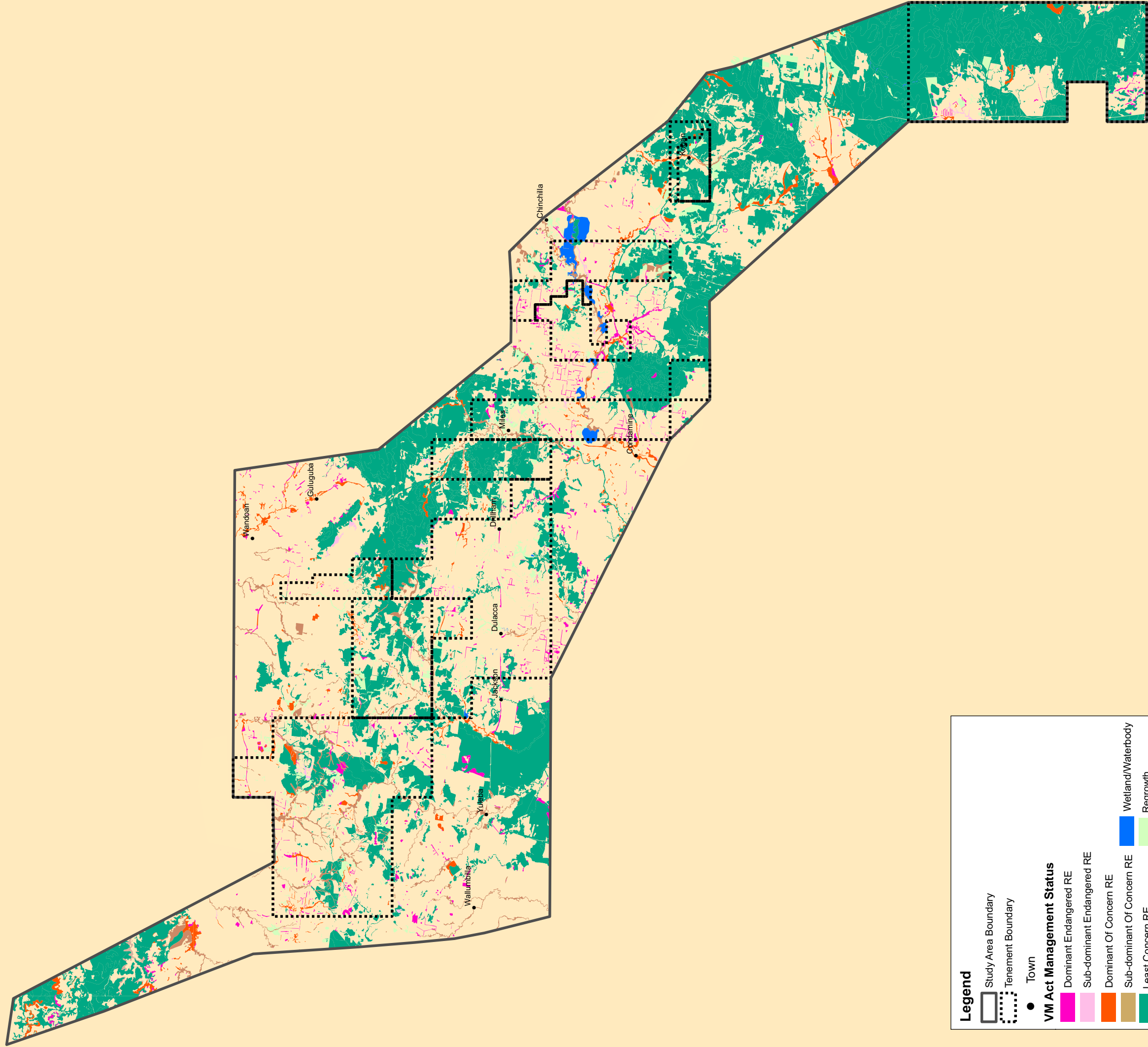
The increase in RE 11.7.2 by 75% is the result of mapping stands and shade lines of Lancewood *Acacia shirleyi* previously too small to be mapped under 1:100,000 mapping rules, as well as the ability to detect photo pattern associated with this community under larger scale aerial photography taken for this study (Neldner *et al.* 2005).

Rock pavements (RE 11.7.5) were often previously mapped as non-remnant disturbed areas. Relation of photo-pattern to on-ground assessments allowed more accurate interpretation of larger scale recent aerial photographs and the subsequent identification of 33% more area of this RE.

Semi-evergreen vine thicket (11.9.4a) not previously mapped was delineated by relation of photo-pattern to on-ground assessments

allowing more accurate-interpretation of larger scale recent aerial photographs and the subsequent identification of approximately 150% more of this nationally endangered community.

Previously, mapped regrowth was limited to Moratorium regrowth (which only included regrowth of an endangered RE) and, more recently, high-value regrowth (which has not been cleared since 31 December 1989 (*Vegetation Management and Other Legislation Bill 2009*)). In contrast, the refined mapping exercise undertaken for this report included all regrowth visible on recent, high resolution arials that amounts to a wider coverage than either of the previous mapping exercises for regrowth.



**Legend**

Study Area Boundary  
Tenement Boundary  
Town

**VM Act Management Status**

Dominant Endangered RE  
Sub-dominant Endangered RE  
Dominant Of Concern RE  
Sub-dominant Of Concern RE  
Wetland/Waterbody  
Regrowth

Figure 2.6  
Study Area Refined Vegetation  
Mapping (VM Act Status)  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS

## EXECUTIVE SUMMARY

### Purpose of the Report

This technical report has been prepared for Worley Parsons on behalf of Australia Pacific LNG Pty Limited (Australia Pacific LNG). It provides a technical assessment of the terrestrial ecological values associated with development of the gas fields component of the proposed Australia Pacific LNG Project, located in southern Queensland, and a subsequent assessment of potential ecological impacts from proposed activities and possible mitigation measures.

The report brings together all relevant existing information regarding the terrestrial ecology of the study area and surrounds, and provides a foundation for project planning to achieve ecological sustainability. The significance and sensitivity of each terrestrial ecological element has been assessed in relation to the proposed impact mechanisms to determine the necessary and most effective means of avoiding, minimising or mitigating the potential impacts of the Project.

### Existing Terrestrial Ecological Values

The study area is part of a highly modified landscape, within which some large remnant tracts of vegetation persist. Such remnants are primarily on less fertile lands at higher altitudes and support ecosystems which are well-represented regionally and are mostly incorporated within the State Forest network. The more fertile, lower altitude lands are intensively grazed, and generally have only small, more isolated patches of remnant vegetation remaining. The now endangered Brigalow communities were once widespread before much of this land was cleared for grazing. Flora and fauna species that are strongly associated with these ecosystems are also affected by their fragmentation, as well as by cattle damage and altered fire regimes. As a result, many of these species share the threatened status of the vegetation communities.

### Methods

The 'study area' for this assessment comprises the gas fields, as well as service infrastructure (high pressure gas pipelines, roads, and so forth) that extends beyond the defined tenement area, totalling 1,470,000ha or 14,700km<sup>2</sup> (**Figure 1.1**). To summarise current terrestrial ecological values within the study area and inform subsequent ground surveys and terrestrial ecology sensitivity assessment, a desktop exercise was undertaken for which a number of relevant and publicly available data sources were accessed and reviewed, including Commonwealth, State and private databases. Where available, unpublished locality data for significant species were also acquired and reviewed to assist in determining potential species' distributions and habitat preferences within the study area. A review of available relevant literature relating to pre-European landscape, land use post-European settlement, current ecological condition and biodiversity conservation and ecosystem function was conducted.

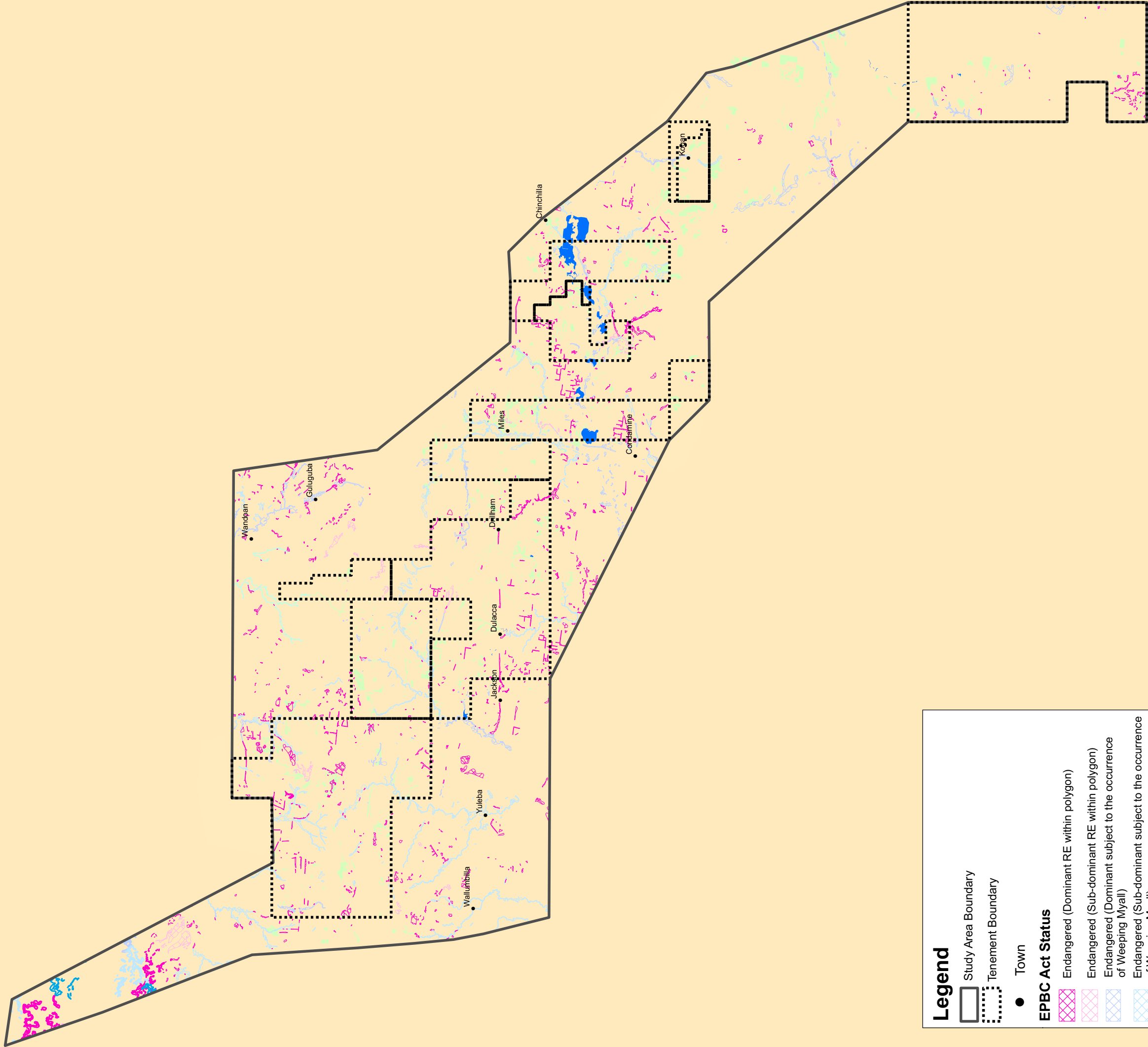
Terrestrial flora and fauna ground surveys were undertaken, involving a combination of targeted species searches, general habitat assessments and verification of current Department of Environment and Resource Management (DERM)-certified Regional Ecosystem (RE) mapping. The primary aims of these surveys were to produce project-specific vegetation/habitat mapping and enable the prioritisation of terrestrial ecological values to inform the subsequent terrestrial ecology sensitivity analysis and impact assessment for the Project.

Sites surveyed were selected based on their Regional Ecosystem (RE) status under the *Queensland Vegetation Management Act 1999* (VM Act), size of the RE patch, size of the remnant tract within which the patch is located, connectivity with other remnant vegetation and presence of riparian corridors. A representative sample of RE types was also









**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)



Figure 2.8  
Study Area Refined Vegetation  
Mapping (EPBC Act Status)  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS

**Table 2.5. Indicative comparison of the extent of each RE within the Study Area based on existing and refined vegetation mapping**

RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4	% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act	Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
11.3.1	E (Brigalow)	E	E	564 (18.12)	792 (25.46)	40.4	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses (Buffel Grass and Green Panic)	Poor
11.3.2	E (includes Weeping Myall)7	OC	OC	12458 (7.42)	14729 (8.77)	18.23	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses (Buffel Grass and Green Panic) Past ring-barking Inappropriate fire regimes	Poor
11.3.3		OC	OC	761 (6.72)	656 (6.44)	-13.8	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses Changed flooding regimes / water extraction.	Poor
11.3.4		OC	OC	2424 (16.53)	2596 (17.70)	6.9	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses Changed fire regime (note: has suffered noticeable tree dieback)	Poor

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RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4		% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act		Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
11.3.14		LC	NC	10703 (17.65)	12590 (20.76)	17.6	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses and Mother of Millions	Poor	
11.3.16		LC	NC	0 (0)	73 (n/a9)	100	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor	
11.3.17		OC	E	81 (1.87)	86 (1.98)	6.2	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor	
11.3.18		LC	NC	3080 (10.23)	3521 (11.70)	14.3	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor	
11.3.19		LC	NC	1771 (6.06)	1782 (6.10)	0.6	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor	
11.3.25		LC	OC	21203 (18.99)	24796 (22.21)	16.95	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses Drought affected	Poor	

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RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4		% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act		Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
								(note: has suffered noticeable tree dieback)	
11.3.26		LC	NC	83 (0.62)	84 (0.64)		1.2	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor
11.3.27		LC	OC	45 (1.42)	48 (1.53)		6.7	Degraded by cattle grazing/pigs Changed overland flows Exotic weed invasion particularly exotic grasses	Poor
11.3.39		LC	NC	889 (7.99)	920 (8.27)		3.49	Degraded by cattle grazing Exotic weed invasion particularly exotic grasses	Poor
11.4.3	E (Brigalow)	E	E	3733 (11.57)	4759 (14.74)		27.5	Degraded by cattle grazing Exotic weed invasion particularly Harrisia Cactus and Mother of Millions	Poor
11.4.7	E (Brigalow)	E	E	256 (8.37)	292 (9.52)		14.1	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass	Poor
11.4.10	E (Brigalow)	E	E	59 (3.70)	64 (4.03)		8.5	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass	Poor

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RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4		% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act		Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
11.4.12		E	E	1099 (25.33)	1183 (27.27)		7.6	Degraded by cattle grazing	Poor
11.5.1		LC	NC	165792 (37.63)	165109 (37.47)		-0.4	Degraded by cattle grazing Thickening of understorey species including Buloke Exotic weed invasion particularly Mother of Millions Erosion of highly erodible soils	Average - Good
11.5.4		LC	NC	29230 (34.37)	29540 (34.73)		1.1	Degraded by cattle grazing Erosion of highly erodible soils Thickening of understorey species	Average
11.5.5		LC8	NC	17912 (21.46)	18235 (21.85)		1.8	Degraded by cattle grazing	Average - Good
11.5.20		LC	NC	15377 (18.58)	16064 (19.41)		4.5	Degraded by cattle grazing	Average - Good
11.5.21		LC	NC	4014 (5.57)	4049 (5.62)		0.9	Degraded by cattle grazing	Average - Good
11.7.1		LC	OC	2281 (5.71)	1951 (7.89)		-14.5	Exotic weed invasion particularly Buffel Grass Erosion of highly erodible soils	Good
11.7.2		LC	NC	9899 (28.36)	17402 (49.86)		75.8	Logging of Lancewood	Good



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RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4		% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act		Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
								Inappropriate fire regimes Fragmentation by roads	
11.7.4		LC	NC	70810 (40.53)	79344 (45.42)	12.1		Degraded by cattle grazing Small-scale timber extraction	Average
11.7.5		LC	NC	14820 (28.49)	19765 (38.00)	33.4		Excavation for gravel pits Fragmentation by roads Inappropriate fire regimes	Average - Good
11.7.6		LC	NC	23492 (13.15)	24070 (13.47)	2.5		Degraded by cattle grazing Logging of Spotted Gum and Ironbarks	Average
11.7.7		LC	NC	50551 (30.79)	49179 (29.95)	-2.7		Degraded by cattle grazing Logging of Ironbark	Average - Good
11.8.3	E (SEVT)	OC	OC	8 (0.07)	8 (0.07)	0.0		Degraded by cattle grazing	Average - Poor
11.9.1	E (Brigalow)	E	E	7 (0.18)	7 (0.18)	0.0		Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass	Poor
11.9.4	E (SEVT)	OC	E	1433 (12.97)	3605 (32.65)	151.57		Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic	Average - Poor

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RE1	Management Status2			Certified Mapped Extent in Study Area3	Refined Extent in Study Area4	% change in area mapped	General Condition Assessment5	Overall Condition6
	EPBC Act	VM Act	EP Act					
							Inappropriate fire regimes Physical edge effects adjoining clearings (for example, increased temperature, increased light and decreased humidity)	
11.9.5	E (Brigalow)	E	E	9738 (12.70)	10897 (14.22)	11.9	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic	Poor
11.9.6	E (Brigalow)	E	E	117 (31.66)	118 (31.80)	0.6	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic	Poor
11.9.7		OC	OC	1819 (3.39)	2375 (4.43)	30.6	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic Thickening of understorey species particularly False Sandalwood	Poor
11.9.9		LC	NC	758 (2.44)	758 (2.44)	0.0	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic Thickening of understorey species particularly False Sandalwood	Poor

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RE1	Management Status <sup>2</sup>			Certified Mapped Extent in Study Area <sup>3</sup>	Refined Extent in Study Area <sup>4</sup>		% change in area mapped	General Condition Assessment <sup>5</sup>	Overall Condition <sup>6</sup>
	EPBC Act	VM Act	EP Act		Ha (% of total Relevant Provinces extent)	Ha (% of total Relevant Provinces extent)			
11.9.10		OC	E	2600 (5.15)	3140 (6.22)		20.8	Degraded by cattle grazing Exotic weed invasion particularly Buffel Grass and Green Panic Thickening of understorey species particularly False Sandalwood	Poor
11.10.1		LC	NC	30447 (22.64)	30743 (22.86)		0.33	Degraded by cattle grazing Logging of Spotted Gum and Ironbark Inappropriate fire regimes	Average
11.10.3		LC	NC	149 (0.21)	149 (0.21)		0.0	Not assessed during the 2009 surveys	
11.10.7		LC	NC	2752 (2.22)	2752 (2.22)		0.0	Not assessed during the 2009 surveys	
11.10.9		LC	NC	14934 (17.33)	14955 (17.35)		0.14	Degraded by cattle grazing Logging of White Cypress Pine Inappropriate fire regimes	Average
11.10.11		LC	NC	6788 (5.5)	7526 (6.09)		10.87	Degraded by cattle grazing Logging of White Cypress Pine Exotic weed invasion particularly Buffel Grass	Average - Good
11.10.13		LC	NC	208 (0.11)	208 (0.11)		0.0	Not assessed during the 2009 surveys	

<sup>1</sup> Refer to Table 2.3 for brief description. For the purposes of this comparison, RE subsets (for example, 11.9.4a and 11.9.4b) have been combined.

2 Where: E = Endangered, OC = Of Concern, LC = Least Concern, NC = No Concern at Present, \* = Threshold (at risk of becoming OC). 'EP Act' status is based on the 'Biodiversity Status' prescribed on DERM's Regional Ecosystem Description Database v6.

3 Based on GIS analysis of 1:100,000 RE mapping (DERM 2009a) and total extent data from EPA (2008d). The latter is only available for each RE as a whole, not for individual subsets (for example, for 11.4.3, not for 11.4.3a).

4 Based on GIS analysis of refined vegetation mapping (Appendix I).

5 Based on representative field site data recorded during the recent ground surveys.

6 For definitions of poor, average and good, see Appendix A.

7 Only where Weeping Myall *Acacia pendula* occurs.

8 'Threshold' REs that are at risk of the remnant extent falling below 30% of its preclearing extent, or having a remnant extent of less than 10 000ha (DERM 2009b).

9 Not currently mapped by the Queensland Herbarium as occurring within the Relevant Provinces.

targeted, regardless of VM Act status, to gather information on species that characterise these vegetation communities and factors affecting their general condition.

Initial surveys were targeted towards locating significant flora and reptile species during suitable seasonal conditions, with incidental data collected for other terrestrial vertebrate species. All subsequent surveys involved RE verification/mapping conducted concurrently with general assessments of fauna structural habitat and fauna species-specific habitat assessments. Flora and/or fauna surveys were also carried out opportunistically at sites deemed suitable when in the field, typically within State Forests, road reserves and stock reserves.

Vegetation, wetland and riparian communities were mapped based on existing Queensland Herbarium mapping, recent aerial photography (2009), known locations of endangered, vulnerable, rare and near threatened flora, Queensland Herbarium data, and site data collected during recent Project specific field survey work (2009).

Landscape-level ecological values were mapped based, in part, on:

- RE type and status under the VM Act
- the species of conservation significant flora and fauna that the RE supports
- the status of the vegetation community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and
- whether or not the habitat patch is within recognised corridors and the size of the tract within which it is located.

Also considered was the legislative status of the flora and fauna species under the Queensland *Nature Conservation Act 1992* (NC Act) and EPBC Act for which the RE provides suitable resources and the importance of the study area to those species. From this, Terrestrial Ecology Sensitivity Maps

were produced for the entire study area and for individual gas field tenements.

### **Environmentally Sensitive Areas**

Environmentally Sensitive Areas relevant to the study area include:

- significant areas proclaimed under the NC Act (for example, National Parks), Queensland *Forestry Act 1959* (Forestry Act) (for example, State Forests) and international treaties/agreements (for example, Ramsar wetlands)

### **threatened '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**

### **important habitats for endangered, vulnerable, rare and near threatened flora and fauna species (including corridors), and**

### **important areas of regrowth vegetation.**

### **Biodiversity Planning Assessment**

The study area falls within the Brigalow Belt South (BBS) bioregion, for which a Biodiversity Planning Assessment (BPA) was revised and updated in 2008. Each BPA uses the Biodiversity Assessment and Mapping Methodology for assessing biodiversity values at the landscape scale in Queensland. Initially, seven Diagnostic Criteria are created based on existing data, following which the results are refined by expert panels, particularly in terms of habitat for significant species, bioregional corridors, other special biodiversity values and key threatening processes in the bioregion of interest. The results and relevant information from the Expert Panel Reports applicable to the study area are provided, along with mapping of overall biodiversity significance and corridors according to the Biodiversity Assessment and Mapping Methodology.

As Queensland Herbarium RE mapping provides the basis for much of the BPA criteria



### ***Terrestrial Vegetation Communities of Special Conservation Significance***

The refined vegetation mapping exercise indicates that 21 terrestrial vegetation communities of special conservation significance occur within the study area, 12 of which are analogous (or, in the case of RE 11.3.2, potentially analogous) to endangered Ecological Communities under the EPBC Act, 13 and nine of which are listed as endangered according to Biodiversity Status and VM Act Status, respectively, and eight and nine of which are listed as of concern according to Biodiversity Status and VM Act Status, respectively. These totals include RE subsets as separate communities (for example, both 11.9.4a and 11.9.4b), whereas they are combined in Table 2.5 to allow the target comparisons to be made with total extent within the Relevant Provinces. As noted in Section 2.3.1, one additional RE (11.5.5) listed as least concern under the VM Act is considered to be at risk of becoming of concern, while RE 11.3.17 can be considered locally endangered based on its remaining extent within the Relevant Provinces.

It should also be noted that a review of DEWHA's mapping of Groundwater Dependant Ecosystems (<http://www.environment.gov.au/biodiversity/threatened/communities/maps/public/artesian-groundwater-dependant-map.pdf>) reveals that no GDEs are known to occur within the study area. However, springs associated with groundwater of the Great Artesian Basin classed as GDEs under this mapping are known to occur within the Relevant Provinces and cannot be ruled out as not existing within the study area without comprehensive ground-truthing.

Detailed profiles for communities of special conservation significance are provided on the DEWHA website (<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>) for Threatened Ecological Communities listed under the EPBC

Act and on the DERM website ([http://www.epa.qld.gov.au/nature\\_conservation/biodiversity/regional\\_ecosystems/](http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/)) for REs.

The distribution of the more noteworthy significant communities within the study area is described below.

#### **Brigalow (REs 11.3.1, 11.4.3, 11.4.7, 11.4.10, 11.9.1, 11.9.5, 11.9.6)**

Status: Endangered (EPBC Act, Biodiversity Status and VM Act).

Brigalow communities occur across the majority of the study area, although past-clearing has resulted in much of these being confined to narrow shade lines and small shade stands less than one ha in size or associated with riparian communities on minor creeks. Areas where these stands are more common include; areas north of the Balonne River, Wieambilla Creek and north of Condamine within the Talinga tenement, North of Moraby Creek, along Drillham Creek and north of Ulimora within the Carinya tenement and Weir River within the Gilbert Gully tenement. One notably large patch of Brigalow occurs within the heart of Combabula State Forest, while some good patches also occur around and within Woodduck State Forest.

#### **Semi-evergreen Vine Thicket (REs 11.8.3 and 11.9.4)**

Status: RE 11.8.3 Endangered (EPBC Act, Biodiversity Status and VM Act) and Of Concern (Biodiversity Status and VM Act); RE 11.9.4 Endangered (EPBC Act and Biodiversity Status) and Of Concern (VM Act).

The larger patches of SEVT known to occur within the study area are located within the southern section of the Woleebee tenement along north-facing slopes of the Gurulmundi plateau. Other areas include shade lines within the north-eastern section of the Combabula tenement, three patches within the eastern part of the Talinga tenement and

some patches within the eastern portion of the Kainama tenement. Many of the patches within the Woleebee tenement are in good condition and, whilst much of those within the Combabula tenement are affected by cattle trampling and grazing, all patches are relatively free from weeds.

#### **Weeping Myall (included within RE 11.3.2)**

Status: RE 11.3.2 Endangered (EPBC Act) where Weeping Myall occurs and Of Concern (Biodiversity Status and VM Act).

Weeping Myall *Acacia pendula* is not listed as a rare, near threatened or threatened species under State or Commonwealth legislation, however, certain woodland communities of the Darling Riverine Plains and BBS bioregions (including 11.3.2) in which it occurs as the dominant canopy species are considered endangered ecological communities under the EPBC Act. Only two small areas of Weeping Myall were located during the 2009 ground surveys – one within the south-western corner of the Carinya tenement and the other toward the centre of the Combabula tenement. In both cases, the community is located within road reserves. Weeping Myall commonly occurs within other communities on alluvial soils and may occur in densities consistent with the Nationally Endangered community in other places within the study area (within RE 11.3.2).

#### **Rock Pavements (RE 11.7.5)**

Status: RE 11.7.5 No Concern at Present and Least Concern (Biodiversity Status and VM Act, respectively).

As noted in Table 2.3, RE 11.7.5 represents vegetation communities that occur on natural scalds. These communities are dominated by low microphyll shrubs (heath) contained within large expanses of Land Zone 7 open forest and woodland distributed across the greater Gurulmundi area, including the wildflower areas of Gurulmundi State Forest. Other, smaller patches occur within Condamine State Forest and other expanses of Land Zone 7 open forest and woodland across the study area. These scalds are also the only known

habitat for locally endemic species such as *Calytrix gurulmundensis* and *Micromyrtus carinata*.

#### **Black Box (11.3.16)**

Status: RE 11.3.6 No Concern at Present and Least Concern (Biodiversity Status and VM Act, respectively).

A riparian community of the ironbark *Eucalyptus largiflorens* exists as a community along Sandy Creek at Talinga, which represents the northernmost known population of this community in Australia (confirmed by the Queensland Herbarium). Although there are reasonably extensive stands of this species along the Moonie, Culgoa and Paroo Rivers, it is certainly a range restricted species in Queensland and the Talinga population is of regional, if not State, significance.

#### **Terrestrial Flora Species of Special Conservation Significance**

In total, the desktop assessment identified 62 flora species of special conservation significance as potentially occurring within the study area. Based on the results of the subsequent literature review, expert opinion and recent ground surveys, 36 flora species of special conservation significance are known or considered possible occurrences within the study area, as detailed in Appendix J and summarised in Table 2.6. This includes 16 species listed as threatened under the EPBC Act, 26 listed as endangered, vulnerable, rare and near-threatened species under the NC Act and seven listed as non-EVR priority species for the BBS bioregion under the BAMM (EPA 2008b). Significant species records obtained during the recent ground surveys are summarised in Table 2.7.

Detailed profiles for terrestrial flora species of special conservation significance known or considered likely to occur are provided in Appendix K.

Two species are of special note due to their highly restricted distribution: *Calytrix gurulumdensis* and *Micromyrtus carinata* are generally restricted to the rock pavements (scalds) of the Gurulmundi Plateau. Some other occurrences of these species are noted within Dalwogan and Barakula State Forests (Craig Eddy pers comm.) The highly restricted distribution and high habitat specificity of these species means their long-term viability is highly susceptible to disturbance.

A significant proportion of the known range of *Philotheca sporadica* (i.e. primarily in Gilbert Gully) is located within the study area, whilst the majority of the known distribution of *Acacia curranii* within Queensland is located within the study area.

Appendix J and Table 2.6 also list those species identified during the desktop assessment that are not considered likely to occur in the study area, based on RE/habitat preference.

### ***Other Sensitive or Important Vegetation Types***

#### **Important Habitat for Significant Flora Species**

Expert panel advice combined with research into the habitat requirements for significant flora species has revealed that certain REs provide potential habitat for large numbers of significant flora species, including REs 11.7.4 (which provides potential habitat for 17 species), 11.4.3 (nine species), 11.4.7, 11.7.6, 11.7.7, 11.9.5 (eight species), 11.9.4a (7 species) and 11.7.5 (six species). The particular habitat values of these REs have been identified as part of the constraints analysis process and levels of protection afforded them within the constraints model (Appendix A and Section 2.5).

Table 2.6. Summary of the likelihood of occurrence of terrestrial flora species of special conservation significance within the Study Area<sup>1</sup>

Family	Species Name	Common Name	Management Status <sup>2</sup>		
			EPBC Act	NC Act	BAMM
Species Known to Occur within the Study Area					
Asteraceae	Rutidosia lanata	Red-soil Woolly Wrinklewort		E	
Caesalpiniaceae	Senna acclina	Rainforest Cassia		R	
Cyperaceae	Cyperus clarus	Bright Flat-sedge		V	
Cyperaceae	Eleocharis blakeana	Blake's Spikerush		R	
Haloragaceae	Gonocarpus urceolatus	Gonocarpus		V	
Mimosaceae	Acacia chinchillensis	Chinchilla Wattle	V	NT	
Mimosaceae	Acacia lauta	Tara Wattle	V	V	
Mimosaceae	Acacia melvillei	Myall		C	X
Mimosaceae	Acacia microsperma	Bowyakka		C	X
Mimosaceae	Acacia omalophylla	Yarran Wattle		C	X
Mimosaceae	Acacia spania	Western Rosewood		R	
Mimosaceae	Acacia tenuinervis	Scrub Wattle		R	
Mimosaceae	Acacia wardellii	Thomby Range Wattle	V	V	
Myrtaceae	Calytrix gurlmundensis	Gurulmundi Fringe Myrtle	V	V	
Myrtaceae	Melaleuca irbyana	Swamp Tea-tree		R	
Myrtaceae	Micromyrtus carinata	Gurulmundi Heath-myrtle		E	
Orchidaceae	Diuris tricolor	Pink Donkey-orchid	V	C	
Orchidaceae	Pterostylis cobarensis	Cobar Greenhood Orchid	V	C	
Poaceae	Homopholis belsonii	Belson's Panic Grass	V	E	
Rutaceae	Philotheca sporadica	a Waxflower	V	V	
Solanaceae	Solanum stenopterum	Winged Nightshade		V	
Surianaceae	Cadellia pentastylis	Ooline	V	V	
Species that Possibly Occur within the Study Area					
Acanthaceae	Xerothamnella herbacea	Herbaceous Xerothamnella	E	E	
Apocynaceae	Tylophora linearis	Slender Tylophora	E	E	
Asteraceae	Picris barbarorum	Plains Picris		C	X

Family	Species Name	Common Name	Management Status <sup>2</sup>		
			EPBC Act	NC Act	BAMM
Cyperaceae	Fimbristylis vagans	Wandering Fringe-rush		R	
Lamiaceae	Prostanthera sp. Dunmore	Dunmore Mint-bush	V	V	
Mimosaceae	Acacia curranii	Curly-barked Wattle	V	V	
Myrtaceae	Eucalyptus curtisii	Plunkett Mallee		R	
Myrtaceae	Eucalyptus rhombica	Diamond-fruited Ironbark		C	X
Myrtaceae	Eucalyptus suffulgens	Shiny-leaved Grey Ironbark		C	X
Myrtaceae	Eucalyptus virens	Shiny-leaved Ironbark	V	V	
Myrtaceae	Eucalyptus viridis	Green Mallee		C	X
Rhamnaceae	Cryptandra ciliata	Silky Cryptandra		R	
Scrophulariaceae	Microcarpaea agonis	Microcarpaea	E	E	
Zamiaceae	Macrozamia fearnsidei	Central Queensland Zamia Palm	V	C	
Species Not Likely to Occur within the Study Area					
Asteraceae	Rhaponticum australe	Austral Cornflower	V	V	
Asteraceae	Rutidosia crispata	Curled Wrinklewort		R	
Byttneriaceae	Commersonia argentea	Commersonia	V	C	
Celastraceae	Denhamia parvifolia	Small-leaved Denhamia	V	V	
Cupressaceae	Callitris baileyi	Bailey's Cypress Pine		R	
Eriocaulaceae	Eriocaulon carsonii	Salt Pipewort	E	E	
Fabaceae	Swainsona murrayana	Slender Darling-pea	V	V	
Haloragaceae	Haloragis exalata ssp. velutina	Tall Velvet Sea-berry	V	V	
Lamiaceae	Westringia parvifolia	Small-leaved Westringia	V	V	
Mimosaceae	Acacia calantha	Cracow Wattle		R	
Mimosaceae	Acacia grandifolia	Large-leaved Wattle	V	C	
Mimosaceae	Acacia handonis	Hando's Wattle	V	V	
Myrtaceae	Corymbia bloxsomei	Bloxome's Yellow Bloodwood		C	X
Myrtaceae	Eucalyptus argophloia	Queensland White Gum	V	V	
Myrtaceae	Eucalyptus beaniana	Bean's Ironbark	V	V	
Myrtaceae	Eucalyptus dunnii	Dunn's White Gum		R	



Family	Species Name	Common Name	Management Status <sup>2</sup>		
			EPBC Act	NC Act	BAMM
Myrtaceae	Homoranthus decumbens	Decumbent Homoranthus	V	V	
Myrtaceae	Homoranthus papillatus	Butterfly Homoranthus		R	
Oleaceae	Notelaea pungens	Pungent Olive		R	
Poaceae	Bothriochloa biloba	Lobed Blue-grass	V	C	
Poaceae	Dichanthium queenslandicum	King Bluegrass	V	V	
Poaceae	Digitaria porrecta	Finger Panic Grass	E	R	
Poaceae	Sporobolus partimpatens	Smooth Dropseed		R	
Rutaceae	Zieria verrucosa	Warty Zieria	V	V	
Santalaceae	Thesium australe	Austral Toadflax	V	V	
Solanaceae	Solanum papaverifolium	a Nightshade		E	

<sup>1</sup> A detailed account of potential occurrence is provided in Table J.1 of Appendix J.

<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.

Table 2.7. Terrestrial Flora Species of Special Conservation Significance Detected within the Study Area during the 2009 Ground Surveys

Family	Species Name	Common Name	Status <sup>1</sup>			Details
			EPBC Act	NC Act	BAMM	
Mimosaceae	Acacia chinchillensis	Chinchilla wattle	V	NT		One record in Orana tenement.
Mimosaceae	Acacia tenuinervis	Scrub wattle		R		Four records in Orana tenement and one in Talinga tenement.
Mimosaceae	Acacia wardellii	Thomby Range Wattle	V	V		One record approximately 2.3km west of Condabri tenement.
Surianaceae	Cadellia pentastylis	Ooline	V	V		Nine records all within Wooleebee tenements.
Myrtaceae	Calytrix gurulmundensis	Gurulmundi Fringe Myrtle	V	V		11 records in Wooleebee tenements.
Poaceae	Homopholis belsonii	Belson's Panic Grass	V	E		Two records in Carinya tenement.
Myrtaceae	Micromyrtus carinata	Gurulmundi Heath-myrtle		E		One record in Carinya tenement and one approximately 1.5km east of Ramyard tenement.

<sup>1</sup> Status abbreviations are as follows: E = Endangered, V = Vulnerable, R = Rare, NT = Near Threatened.

### **The Value of Regrowth to Significant Flora Species**

The term regrowth applies to native vegetation at many stages of community development, ranging from very sparse low shrubs to 'nearly remnant' tall open forest with structural complexity, leaf litter and woody debris and many niches for threatened flora and fauna species. In general, most regrowth lacks the structure and physical conditions of remnant vegetation and therefore infrequently provides adequate habitat features required to support significant flora species.

Studies of forest succession indicate that even after 100-150 years of regeneration, the floristic composition and structure of regrowth forests often differ considerably from mature forests (Turner et al. 1997; Foster et al. 1998; Bowen et al. 2007). Indeed, condition can be an overriding factor influencing biodiversity values of native vegetation communities (McIntyre 1994), with many threatened species disappearing due to their sensitivity to disturbance.

Nonetheless, non-remnant or disturbed vegetation areas have been shown to provide effective habitat for flora and fauna in Queensland (Dorricott et al. 1997; Exelby and Meltzer 2001). There are substantial areas of regrowth vegetation within the BBS bioregion, including approximately 37,675ha within the study area alone as shown on the refined vegetation mapping in Appendix I. The value of regrowth to fauna species is further discussed in Section 2.4.2.

### **Wetlands and Riparian Corridors**

Wetlands and riparian corridors are inherently higher in biodiversity than the surrounding landscape (Bentley and Catterall 1997; Kingsford 2000; Jansen and Robertson 2001; Martin et al. 2006). They provide water for many flora and fauna species inhabiting specialist habitats characterised by permanent/semi-permanent surface water. Wetlands within the study area are thought to provide suitable habitat for at least three

significant flora species *Eleocharis blakeana*, *Cyperus clarus* and *Fimbristylis vagans*.

The distribution of wetlands and waterbodies is shown on the revised vegetation mapping in Appendix I.

Wetland areas include 'flooded paddocks' (predominantly restricted to the floodplain for the Condamine River), 'natural in-stream waterbodies' (the majority of which occur within the bed and banks of the Condamine and Balonne rivers and Wilkie Creek) and a number of man-made waterbodies across the landscape.

Descriptions of vegetated riparian corridors are summarised for each tenement in Table 2.8. Further discussion of fauna movement corridors across the study area is provided in Sections 2.2 and 2.4.2.

**Table 2.8: Summary of vegetated riparian corridors within each tenement**

Tenement	Vegetated Riparian Corridors
Gilbert Gully	Several small creek lines, namely Scrubby, Western, Bulli, and Waggaba Creeks, flow west across the tenement into Weir River. These creeks are well vegetated with wide riparian corridors and buffering vegetation. Riparian vegetation communities include dominant RE 11.3.14, subdominant RE 11.3.18 and associated REs 11.3.25 and 11.3.2.
Kainama	Kogan Creek flows in a north-south direction, bisecting the tenement. The riparian areas of this creek are well vegetated and well buffered by surrounding remnant vegetation. Characteristic riparian vegetation communities are RE 11.3.2 and sub-dominant RE 11.3.18.
Talinga/ Orana	<p>The Condamine – Balonne flows east-west through the middle of this tenement and is the largest river system within the Study Area. Much of its floodplains have been cleared for agriculture, although the remaining narrow riparian area is continuous and well vegetated. The dominant riparian vegetation communities include dominant RE 11.3.25, subdominant RE 11.3.4 and associated REs 11.3.3 and 11.3.1.</p> <p>Wieambilla Creek is another of the major creeks running through the tenement, flowing in a north-westerly direction. Its riparian areas are less well vegetated and not well buffered by native vegetation communities. The major riparian vegetation communities in order of dominance are RE 11.3.4, RE 11.3.2, RE 11.3.14 and 11.3.3.</p> <p>Dogwood Creek crosses the far north-western corner of the tenement. A portion of this creek is vegetated by the riparian community RE 11.3.16 (<i>Eucalyptus largiflorens</i> ± <i>Acacia cambagei</i> ± <i>A. harpophylla</i> woodland to low open woodland on alluvial plains), a community discussed previously as being the most northerly example of this vegetation community in Queensland.</p>
Condabri	<p>Dogwood Creek passes in an east-west direction across the top of this tenement. Some of its riparian areas are well vegetated, whilst other areas are regrowing. Dominant vegetation includes REs 11.3.25 and 11.3.2.</p> <p>The Condamine – Balonne flows east-west through the southern part of the tenement. Its riparian areas are dominated by REs 11.3.25 and 11.3.3. The narrow riparian areas are well vegetated although not well buffered by remnant vegetation.</p>
Dalwogan	Wallan Creek runs in a north-south direction through this tenement. Its riparian areas are buffered to some degree by the vegetation of Gurulmuni State Forest along its western banks. Much of the flat alluvial areas have been cleared, including some riparian vegetation, making the riparian corridor narrow and disjunct. Remaining riparian areas are dominated by REs 11.3.25 and 11.3.2.
Woleebee	Wandoan Creek runs south-north through the central-western portion of this tenement. This major creek has a narrow riparian strip that is not buffered by other terrestrial vegetation. Parts of this riparian corridor are highly disturbed and patchy. The riparian vegetation is dominated by REs 11.3.25, 11.3.19 and 11.3.2.
Carinya	Tchanning Creek runs in a north-south direction through this tenement. This major creek is well vegetated and buffered by vegetation in the upper reaches. The middle and lower reaches are poorly vegetated within the riparian areas, dominated by thin and patchy regrowth. Riparian vegetation is dominated by REs 11.3.25, 11.3.2 and 11.3.18.

Tenement	Vegetated Riparian Corridors
	<p>Dulacca and Drillham Creeks in the south of the tenement are poorly buffered by remnant vegetation, while remaining riparian vegetation is thin, degraded and disjunct. Where present, riparian vegetation is dominated by REs 11.3.25, 11.3.18 and patches of 11.9.5 (Brigalow open forest).</p>
Combabula/ Ramyard	<p>Three minor creeklines flow south-north across the top of this tenement and are not buffered by any surrounding remnant vegetation. The very narrow riparian areas are sparse and disjunct and dominated by REs 11.3.25, 11.3.2 and patches of 11.9.5.</p> <p>Yuleba Creek flows in a north-south direction through the southern section of the tenement. In general this creek is well buffered by surrounding remnant vegetation and riparian communities are substantially complete. The latter are dominated by REs 11.3.25, 11.3.2 and patches of 11.9.5.</p>



and associated mapping, the project-scale assessment of REs (as undertaken for this report) replaces the need to examine the broad-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, namely Tract Size and Corridors.

### Terrestrial Flora

A predictive database search indicates that six threatened ecological communities and 33 terrestrial flora species listed under the EPBC Act may occur within the study area. Certified RE mapping identifies 47 REs currently mapped within the study area, covering approximately 535,000ha, about 36% of the study area. This includes nine of concern REs and nine endangered REs under the VM Act. A search of database records and a review of unpublished data indicates that at least 49 terrestrial flora species of special conservation significance have been previously recorded within the study area, including 20 species listed as threatened under the EPBC Act, 38 listed as endangered, vulnerable, rare or near threatened species under the NC Act and eight listed as non-EVR priority species for the BBS bioregion.

The existing certified RE mapping also indicates that the study area supports approximately 15,500ha (around 1% of the study area) of Essential Habitat for flora and fauna species listed under the provisions of the NC Act. Mapping layers obtained from DERM indicate that no areas listed under the Queensland Directory of Important Wetlands occur within the study area. Only 45ha of freshwater wetland communities are currently mapped, revealing the dry character of the local landscape.

Major differences were identified between the refined vegetation mapping layer (as a result of field surveys and review) and that of the certified RE mapping. These included an additional 36,000ha of remnant vegetation; an

increase in REs 11.3.1, 11.4.3 and 11.9.5 (Brigalow) by 40%, 28% and 12%, respectively; an increase in RE 11.7.2 by 75%; identification of 33% more area of RE 11.7.5 (rock pavements), better delineation of RE 11.9.4a (semi-evergreen vine thicket) resulting in the identification of 150% more area of this nationally endangered community and improved mapping of regrowth. Twenty-one terrestrial vegetation communities of special conservation significance occur within the study area, 12 of which are analogous to endangered Ecological Communities under the EPBC Act and 13 and nine of which are listed as endangered according to their biodiversity status and VM Act status, respectively. One additional RE (11.5.5) listed as least concern under the VM Act is considered to be at risk of becoming of concern, while RE 11.3.17 can be considered locally endangered based on its remaining extent within relevant bioregional provinces.

The refined vegetation mapping also identified approximately 37,675ha of regrowth in the study area.

Based on the results of the subsequent literature review, expert opinion and recent ground surveys, 36 flora species of special conservation significance are known or considered possible occurrences within the study area, including 16 species listed as threatened under the EPBC Act, 26 listed as endangered, vulnerable, rare or near threatened species under the NC Act and seven listed as non-EVR priority species for the BBS bioregion.

Nineteen exotic weed species were identified in the study area, none of which is of national significance though seven species are declared under the Land Protection (Land and Stock Route Management) Act 2002 (LP Act) and 15 are recognised environmental weeds. Database searches and non-public data identified a further 181 non-native species as being present within the study area, of which three species are recognised weeds of national significance and nine species are listed under the LP Act 2002. In general, REs on alluvial

## Weeds

The 2009 ground surveys identified the presence of 19 exotic species for the study area, as listed in Table 2.9 along with an indication of potential RE preferences within the study area based on observations from the 2009 ground surveys. No weed of national significance was recorded, although seven of the 19 exotic species are declared under the Land Protection (Land and Stock Route Management) Act 2002 (LP Act), and 15 are recognised environmental weeds.

Database searches and non-public data identified a further 181 non-native species as being present within the study area, of which nine species are listed under the LP Act 2002 (Table 2.9). Of these, *Lantana camara*, *Parkinsonia aculeata*, and *Parthenium hysterophorus* are also recognised weeds of national significance. *Parthenium* is subject to current control within the Talinga tenement (Craig Eddie pers. comm.).

In general, REs that fall within Land Zone 3 (alluvial soils) have the widest diversity of weeds present, whereas Land Zones 5 and 10 have sandy soils of low fertility and generally have lower weed counts.

Table 2.9 also lists 59 additional recognised environmental weeds recently recorded within the study area by Craig Eddie.

Although no weeds have been observed to be preventing regeneration on a large scale at present, some species are potentially problematic given the proposed activities (that is, clearing, introduction/spread during construction and so forth). These species, together with some insights into the autecology, are discussed below.

### **Mother of Millions *Bryophyllum delagoense* (and hybrids)**

This Class 2 declared species (LP Act) is one of the most prevalent exotic species within the study area. Due to its ability to produce new

plants from each broken fragment, there is a high potential for further spread, particularly via earthworks and, to a lesser extent, on vehicles.

### **Cacti species**

Prickly Pear species (*Opuntia stricta* and *O. tomentosa*) are kept at low levels by the *Cactoblastis* moth. Tiger Pear *Opuntia aurantiaca* is not controlled by the *Cactoblastis* moth and has long hooked spines enabling transport by attaching to animal skins, car tyres and human clothing and boots. This mechanism of spread suggests that, without affective control, activities associated with the Project may cause the spread of this weed. Similarly, *Harrisia cactus eriocereus martini* is not controlled by the *Cactoblastis* moth and the spread of this weed within brigalow areas via increased vehicular movement is a concern, with some infestations preventing natural regeneration.

### **Parthenium**

This species is currently limited in its extent within the study area, although it remains a concern due to its potential impacts if allowed to spread and proliferate. Proposed activities have the potential to spread this Class 2 (LP Act) species rapidly throughout the study area in the absence of suitable management controls.

### **African Boxthorn *Lycium ferocissimum***

African Boxthorn is known from scattered plants/small infestations in most tenements (Craig Eddie pers. comm.). This species is adapted to many soil types and proliferates within disturbed areas. Proposed activities could potentially create large areas of disturbance with increased available water suitable for the proliferation of this species.

### **Parkinsonia**

*Parkinsonia* is currently limited in its extent within the study area, with the occasional, isolated plant and no known infestations (Craig Eddie pers. comm.). However, this species is adapted to many soil types and proliferates within disturbed areas. Proposed activities

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could potentially create large areas of disturbance with increased available water suitable for the proliferation of this species.

**Crownbeard *Verbesina encelioides* and  
Snake Cotton *Froelichia floridana***

Once established, these species are sometimes an ecological nuisance in sandy substrates as they respond favourably to disturbance and out- compete native flora (Craig Eddie pers. comm.).

**Table 2.9. Terrestrial Weed Species Known to Occur Within the Study Area**

Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Amaranthaceae	Alternanthera pungens	Khaki Weed			X			X	
Amaranthaceae	Amaranthus viridis	Green Amaranth			X			X	
Amaranthaceae	Froelocia floridana	Snake Cotton			X			X	
Amaranthaceae	Gomphrena celosioides	Gomphrena Weed			X			X	
Apiaceae	Ammi majus	Bishop's Weed			X			X	
Apiaceae	Cyclospermum leptophyllum	Marsh Parsley			X			X	
	Gomphocarpus physocarpus	Balloon Cotton			X			X	
Asteraceae	Argemone sp.	Mexican Poppy	X					X	11.3.25
Asteraceae	Baccharis halimifolia	Groundsel Bush		X			Class 2	X	
Asteraceae	Bidens pilosa	Cobbler's Pegs			X			X	
Asteraceae	Centaurea melitensis	Maltese Cockspur			X			X	
Asteraceae	Cirsium vulgare	Spear Thistle			X			X	
Asteraceae	Conyza bonariensis	Fleabanes			X			X	
Asteraceae	Hypochaeris radicata	Catsear			X			X	

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Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Asteraceae	<i>Lactuca serriola</i> forma <i>serriola</i>	Prickly Lettuce			X			X	
Asteraceae	<i>Parthenium hysterophorus</i>	Parthenium		X		x	Class 2	X	11.3.1, 11.3.2, 11.3.3, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 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
Asteraceae	<i>Schkuhria pinnata</i>	Pinnate False Threadleaf			X			X	
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	X	X			Class 2	X	11.4.3, 11.5.1
Asteraceae	<i>Silybum marianum</i>	Variegated Thistle			X			X	
Asteraceae	<i>Sonchus oleraceus</i>	Common Sowthistle			X			X	
Asteraceae	<i>Tagetes minuta</i>	Stinking Roger			X			X	
Asteraceae	<i>Verbesina encelioides</i>	Crownbeard			X			X	
Asteraceae	<i>Xanthium occidentale</i>	Noogoora Burr			X			X	
Asteraceae	<i>Xanthium spinosum</i>	Bathurst Burr			X			X	
Asteraceae	<i>Zinnia peruviana</i>	Wild Zinnia			X			X	
Bignoniaceae	<i>Macfadyena unguis-cati</i>	Cat's Claw Creeper		X			Class 3	X	11.9.4, 11.3.25, 11.3.26, 11.3.27, 11.3.3
Boraginaceae	<i>Heliotropium amplexicaule</i>	Blue Heliotrope			X			X	

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Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Brassicaceae	Brassica juncea	Indian Mustard	X						11.3.25, 11.4.3, 11.9.5
Brassicaceae	Brassica tournefortii	Wild Turnip			X			X	
Brassicaceae	Lepidium bonariense	Argentine Peppercress			X			X	
Brassicaceae	Rapistrum rugosum	Annual Bastardcabbage			X			X	
Brassicaceae	Sisymbrium irio	London Rocket			X			X	
Brassicaceae	Sisymbrium thellungii	African Turnip-Weed			X			X	
Cactaceae	Cereus uruguayanus	Hedge Or Apple Cactus			X			X	
Cactaceae	Cylindropuntia imbricata	Devil's Rope Pear			X			X	
Cactaceae	Eriocereus martini	Harrisia Cactus	X	X			Class 2	X	11.5.1, 11.5.21, 11.7.4, 11.9.3, 11.9.5
Cactaceae	Harrisia tortuosa	A Harrisia Cactus			X			X	
Cactaceae	Opuntia aurantiaca	Tiger Pear	X	X			Class 2	X	11.3.25, 11.5.1a, 11.7.7
Cactaceae	Opuntia sp.	Prickly Pear	X	X				X	11.9.5
Cactaceae	Opuntia stricta	Prickly Pear	X	X			Class 2	X	11.3.2, 11.3.25, 11.3.4, 11.4.12, 11.4.3, 11.5.1, 11.5.1a, 11.7.1, 11.7.4, 11.7.7, 11.9.10, 11.9.5
Cactaceae	Opuntia tomentosa	Velvety Tree Pear	X	X			Class 2	X	11.3.18, 11.3.25, 11.4.3, 11.4.7, 11.5.1, 11.5.1a,



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Family	Species Name	Common Name	Source1				Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW		
									11.5.20, 11.7.1, 11.7.2, 11.7.4, 11.7.4c, 11.7.7, 11.9.1, 11.9.4a, 11.9.5, 11.9.7, 11.9.10, 11.9.13, 11.10.1, 11.10.7, 11.10.9, 11.10.11	
Crassulaceae	Bryophyllum delagoense	Mother of Millions	X	X			Class 2	X	11.5.1	
Crassulaceae	Bryophyllum sp.		X	X			Class 2	X	11.3.25, 11.3.18, 11.9.5	
Cucurbitaceae	Citrullus lanatus var. lanatus	Watermelon			X			X		
Euphorbiaceae	Ricinus communis	Castor Oil Plant	X	X				X	11.3.25,	
Fabaceae	Macroptilium lathyroides	Phasey Bean			X			X		
Fabaceae	Medicago polymorpha	Burr Medic	X	X				X	11.3.25, 11.3.18	
Fabaceae	Parkinsonia aculeata	Parkinsonia		X		x	Class 2	X	11.3.1, 11.3.2, 11.3.3, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.4a, 11.5.5, 11.5.20, 11.5.21, 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	
Fabaceae	Trifolium repens	White Clover	X						11.3.25	
Lauraceae	Cinnamomum camphora	Camphor Laurel		X			Class 3	X	Only planted in townships, not seen in native vegetation communities.	
Malvaceae	Malva parviflora	Small-Flowered Mallow			X			X		

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Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Malvaceae	Malvastrum americanum var. americanum	Spiked Malvastrum			X			X	
Malvaceae	Malvastrum coromandelianum	Prickly Malvastrum			X			X	
Malvaceae	Pavonia hastata	Pink Pavonia			X			X	
Malvaceae	Sida rhombifolia	Paddy's Lucerne	X	X					11.3.25
Malvaceae	Sida rhombifolia	Paddy's Lucerne			X			X	
Mimosaceae	Acacia farnesiana	Mimosa Bush			X			X	
Poaceae	Cenchrus echinatus	Mossman River Grass			X			X	
Poaceae	Cenchrus incertus	Spiny Burrgrass			X			X	
Poaceae	Cynodon dactylon	Bermuda Grass	X	X					11.3.25, 11.3.27
Poaceae	Echinochloa colona	Awnless Barnyard Grass			X			X	
Poaceae	Eragrostis cilianensis	Stinkgrass			X			X	
Poaceae	Eragrostis curvula	African Lovegrass	X	X				X	11.5.20
Poaceae	Eragrostis pilosa	Soft Lovegrass			X			X	
Poaceae	Megathyrus maximus	Green Panic	X	X				X	11.3.2, 11.3.4, 11.3.18, 11.3.25, 11.5.5, 11.9.5

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Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Poaceae	Melinis repens	Red Natal Grass			X			X	
Poaceae	Paspalum dilatatum	Paspalum			X			X	
Poaceae	Pennisetum ciliaris	Buffel Grass	X	X				X	11.3.1, 11.3.25, 11.4.3
Poaceae	Sorghum halepense	Johnson Grass			X			X	
Poaceae	Sporobolus coromandelianus	Madagascar Dropseed			X			X	
Poaceae	Sporobolus indicus v. pyramidalis	Giant Rat's Tail Grass		X			Class 2	X	
Poaceae	Urochloa mosambicensis	Sabi Grass			X			X	
Poaceae	Urochloa panicoides	Liverseedgrass			X			X	
Polygonaceae	Emex australis	Three Cornered Jack			X			X	
Portulacaceae	Portulaca oleracea	Pigweed			X			X	
Primulaceae	Anagallis arvensis	Blue Pimpernel			X			X	
Rubiaceae	Richardia brasiliensis	White Eye			X			X	
Sapindaceae	Cardiospermum grandiflorum	Heart Seed Vine		X			Class 3	X	
Solanaceae	Datura ferox	Fierce Thornapple			X			X	

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Family	Species Name	Common Name	Source1			Management Status2			Associated REs3
			BAAM	DB	Other	WONS	LP Act	EW	
Solanaceae	Lycium ferocissimum	African Boxthorn		X			Class 2	X	11.3.1, 11.3.2, 11.3.3, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.4a, 11.5.5, 11.5.20, 11.5.21, 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
Solanaceae	Solanum nigrum subsp. nigrum	Black Nightshade			X			X	
Verbenaceae	Lantana camara	Lantana		X		X	Class 3	X	11.9.4, 11.3.25, 11.3.26, 11.3.27, 11.3.3
Verbenaceae	Phylla canescens	Lippia			X			X	
Verbenaceae	Verbena aristigera	Mayne's Pest	X	X				X	11.3.4, 11.3.18, 11.3.25, 11.4.3, 11.4.12, 11.5.1, 11.5.1a, 11.5.5, 11.9.5
Verbenaceae	Verbena aristigera	Mayne's Pest			X			X	
Verbenaceae	Verbena bonariensis	Purpletop			X			X	
Verbenaceae	Verbena littoralis	Verbena			X			X	

1 Where: BAAM = 2009 ground surveys undertaken by BAAM, DB = additional database records for declared species, CE = additional species provided by Craig Eddie.

2 Where: WONS = Weeds of National Significance, LP Act = declared pests under the LP Act, EW = recognized environmental weed.

3 Only completed for species detected during the 2009 ground surveys and additional declared species obtained from database searches. Based on representative field site data recorded during the recent ground surveys and background research on habitat preferences.

### **Spiny Burrgrass *Cenchrus incertus***

This species is easily spread on vehicle tyres and clothing through barbed seeds that adhere to wool, fur, bags and other fibrous material (Parsons and Cuthbertson 2001). It currently grows along Wieambilla Creek and can be problematic in sandy areas once established (Craig Eddie pers. comm.).

### **Lippia *Phyla canescens***

Lippia is a prostrate perennial herb that can spread over vast areas of land both vegetatively and by seed. Vegetative material breaks off the main plant during flooding events and can remain dormant until suitable environmental conditions occur. The species appears to be particularly adapted to floodplain clay soils but has been found occurring on lighter soils and in non-flood-prone environments. The spreading nature and deep rooting system of Lippia are associated with stream bank and soil erosion, structural damage to roads, and high control costs.

### **Giant Rat's Tail Grass *Sporobolus indicus* v. *pyramidalis***

Possibly limited by rainfall across the study area, this species prefers average rainfall in excess of 600mm per year. Giant Rat's Tail Grass has adapted to a wide variety of soil types and once established is capable of invading undisturbed habitats. Vehicular movement associated with proposed activities has the potential to spread this species rapidly. Increased surface waters may also increase the chances of this species spreading.

### **Exotic Pasture Grasses**

Of the numerous exotic pasture grasses that occur within the study area, Green Panic *Megathyrsus maximus*, Buffel Grass *Pennisetum ciliaris* and African Lovegrass *Eragrostis curvula* have the most potential to impact on the condition of native vegetation communities. These species proliferate in disturbed areas and once established have

the potential to invade natural areas. Heavy infestations have the potential to prevent regeneration of native species, whilst altered fire regimes and intensities due to the weeds' contributions to fuel loads create a positive feedback loop that can destroy the integrity of native vegetation communities.

Three additional exotic flora species that have not been confirmed within the study area but have the potential to occur are described below. These species would have significant negative impacts and it is therefore important that occurrences of these species are noted and steps put in place to manage or, preferably, eradicate infestations.

### **Athel Pine *Tamarix aphylla***

Athel Pine is a weed of National Significance and is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. Athel Pine is drought resistant and is well suited to arid and semi-arid rangelands. It is tolerant of saline and alkaline soils and, although it flourishes best in and around rivers, is not restricted to the riverine environment. Infestations are known from the Burnett and Darling Downs regions (CRC for Australian Weed Management 2003).

### **Mesquite *Prosopis* spp.**

This weed occurs in semi-arid subtropics and tropics, mostly in better watered valley bottoms, gullies and intermittently flowing streams beds, occurring on a range of sands and sandy loams, usually at altitudes below 1500m. Plants spread readily from these water courses to the adjacent higher ground, under the influence of grazing and favourable summer rains, and are often found along roadsides near areas of habitation. In Australia, all forms of mesquite tend to grow on heavier (more clayey) soils that support open woodland or grassland (Parsons and Cuthbertson 1992).

All *Prosopis* spp. and hybrids, other than *Prosopis glandulosa*, *Prosopis pallida* and

soils have the widest diversity of weeds present in the study area.

### Terrestrial Fauna

A predictive database search indicated that 20 terrestrial fauna species listed as threatened and 17 species listed as Migratory under the EPBC Act may occur within the study area. State and private databases identify 108 fauna species of special conservation significance previously recorded within the study area or its surrounds, including 46 species listed as threatened and/or Migratory under the EPBC Act, 37 listed as endangered, vulnerable, rare or near threatened species under the NC Act, 42 listed as non-EVR priority species for the BBS bioregion and one species listed as Extinct.

Following field survey and expert review, 99 species of special conservation significance are known or considered possible occurrences within the study area, including 15 species listed (or pending listing) as threatened and 28 species listed as Migratory under the EPBC Act, 32 listed as endangered, vulnerable, rare or near threatened species under the NC Act and 38 listed as non-EVR priority species for the BBS bioregion. Eighteen feral terrestrial vertebrate species are known from surveys and databases. Six of these species are recognised as Class 2 pests under the LP Act.

Known or likely use of particular REs by each conservation significant species is identified and habitat use on a broader scale is also considered. Remnant and non-remnant areas within the study area are allocated to nine broad habitat types, including remnant and non-remnant habitats. The value of these habitats to conservation significant terrestrial fauna is discussed.

### Summary of Existing Terrestrial Ecological Values and Associated Sensitivities to Disturbance

The accumulated terrestrial ecology information was presented as a sensitivity map and was used by Australia Pacific LNG to identify an ecologically sensitive infrastructure

layout, which subsequently provided the basis of the impact assessment. In addition to the considerations described above in Methods, areas known, or considered likely, to support particular threatened species with very limited distributions, known colonies or populations of threatened species, important habitat features and waterbodies are mapped as being sensitive to Project impacts.

### Impact Assessment

The infrastructure layout subsequently provided by Australia Pacific LNG has been used to determine clearing requirements and other potential impacts of the Project. Impact mechanisms resulting from the proposed Project, including clearing, construction, operation and decommissioning are described, along with their likely duration and severity. Mitigation actions for management guidelines and offset requirements are also identified.

### Methods

Impacts on ecological values can be considered in terms of direct and indirect effects, both short-term and long-term. Direct impacts refer to the loss of vegetation and habitat, usually through land clearing, while indirect impacts are secondary effects such as weed invasion and increased sedimentation. Impacts vary in their potential to occur, intensity (scale) and duration, and may be either positive or negative. These impacts and their species-specific consequences have been assessed both as unmitigated impacts and mitigated (residual) impacts that is, with the implementation of certain mitigation actions. Where mitigation may not be possible or does not completely mitigate the impact, appropriate and practical offset actions are identified. Impacts remaining after mitigation are referred to as 'residual impacts'.

Matrices have been provided for each significant/sensitive ecological element present in the study area. These matrices summarise the source of the impact, the potential effects on each ecological element, appropriate



*Prosopis velutina* (which are all Class 2) are Class 1 declared plants under the LP Act and are Weeds of National Significance.

**Prickly Acacia *Acacia nilotica* subsp. *indica***

Bioclimatic modeling suggests much of Queensland is climatically suitable for this Class 1 species (LP Act). In Queensland, Prickly Acacia is currently distributed from Karumba in the north to the New South Wales border in the south, and from Bowen in the east, to the Barkly Tableland in the west. The mass establishment of Prickly Acacia is episodic, relying on a succession of above-median, wet season rainfalls (Thompson 1992).

## 1.6 Terrestrial Fauna Results

The methodology adopted for the terrestrial fauna assessment is provided in detail in Appendix A. Key tasks included:

A desktop review of relevant data sources, including publicly available databases, and environmental mapping and planning documentation

A comprehensive review of available literature relevant to the terrestrial fauna of the study area

Project-specific ground surveys, including targeted searches for significant terrestrial fauna species undertaken between 22<sup>nd</sup> April and 8<sup>th</sup> May 2009, and subsequent surveys undertaken between 27<sup>th</sup> July to 28<sup>th</sup> September 2009 for the assessment of fauna habitat values, and

Identification of available habitat for significant fauna species based on associated vegetation communities and determined via consultation with an expert panel convened specifically for the project, including Mr Craig Eddie (Managing Director of Boobook and contractor to Australia Pacific LNG), Mr Steve Wilson (Herpetologist with the Queensland Museum and subconsultant to BAAM), Mr Tim Low (Principal Ecologist and

subconsultant to BAAM), Mr Terry Reis (Director and Principal Ecologist of BAAM), Dr John Stanisic (Malacologist, Director and Principal Biodiversity Scientist of BAAM) and Mr Adrian Caneris (Managing Director and Principal Wildlife Expert of BAAM).

### 1.6.1 Existing Desk Top Information

With the exception of those values discussed previously in Sections 2.1, 2.2 and 2.3, the following is a summary of currently recognised ecological values known or potentially occurring within the study area in terms of terrestrial fauna species and habitats. Where necessary, this information is revised or refined in Section 2.4.2, based on the results of the 2009 ground surveys undertaken for this report.

#### EPBC Act - Protected Matters

The EPBC Act Online Protected Matters Search Tool results (DEWHA 2009a) provided in Appendix E indicate that 20 terrestrial fauna species listed as threatened under the EPBC Act may occur within the study area, including six Endangered species and 14 Vulnerable species. The search results also indicate that 17 additional terrestrial fauna species listed as Migratory under the EPBC Act may occur within the study area.

Due to difficulties associated with the shape of the study area and the restrictions imposed by the EPBC Act Online Protected Matters Search Tool, the area searched for this component of the desk top assessment includes areas well outside of the study area. Consequently, the actual or potential occurrence of these species within the study area is discussed further in Section 2.4.2, following consideration of the findings of the recent ground surveys and mapping refinements.

### **Existing Data**

A search of species records obtained from the DERM WildNet database (DERM 2009c, d), Queensland Museum database (Queensland Museum 2009) and Birds Australia Atlas database (Birds Australia 2009) (provided in Appendix G) indicates that at least 108 terrestrial fauna species of special conservation significance have been previously recorded within the study area, including 46 species listed as threatened and/or migratory under the EPBC Act, 37 listed as endangered, vulnerable, rare or near threatened species under the NC Act, 42 listed as non-EVR priority species for the BBS Bioregion (EPA 2008a) and one species listed as extinct. These are presented and discussed further in Section 2.4.2, following consideration of the findings of the recent ground surveys and vegetation mapping refinements.

It should be noted that database records listed in Appendix G are provided using the nomenclature of the source. There is a lack of uniformity in nomenclature across the organisations that maintain the databases. In an effort to simplify nomenclature in relation to terrestrial vertebrate species, this report (unless otherwise noted) follows the nomenclature provided by the Australian Faunal Directory maintained by DEWHA (2009b) as it provides a single point of reference for all terrestrial vertebrate groups.

### **Literature Review**

The literature review presented in Appendix H contains a summary of published information regarding fauna species and habitats from within the study area. Where necessary, this information has been used to inform the subsequent, refined assessments of terrestrial fauna values in Section 2.3.2 and the impact assessment in Section 3.0.

### **1.6.2 Ground Surveys and Subsequent Information Refinements (2009)**

A description of the methodology employed for the surveys of terrestrial fauna species and habitat undertaken for the current assessment are provided in Appendix A. The following is a description of terrestrial fauna species and habitats recorded during the surveys, or considered likely to occur based on the findings of the surveys, including a refinement of the results provided in Section 2.4.1, as necessary.

#### ***Terrestrial Fauna Species of Special Conservation Significance***

Based on the results of the desk top assessment and recent ground surveys, 99 terrestrial fauna species of special conservation significance are known or considered possible occurrences within the study area, as detailed in Appendix J and summarised in Table 2.10. This includes 15 species listed (or pending listing) as threatened under the EPBC Act, 28 species listed as migratory under the EPBC Act, 32 listed as endangered, vulnerable, rare or near threatened species under the NC Act and 38 listed as non-EVR priority species for the BBS Bioregion under the BAMM (EPA 2008a). The listings are not mutually exclusive. Significant species records obtained during the recent ground surveys are summarised in Table 2.11.

A species for which there are very few records may be regarded as either a vagrant or as a 'marginal' species in the study area. In this instance a vagrant is a species well outside of its normal range and a marginal species is one found in the surrounding landscape and that would possibly occur more frequently if more suitable habitat was present in the study area. Habitat may refer not simply to vegetation composition and structure but also to disturbance regimes.

Appendix J and Table 2.10 also list those species obtained from the desktop

assessment, including some from outside the actual study area, that are not expected to occur, based on RE/habitat preference or a lack of actual records.

The REs important to, or indicative of, those species known or considered possible occurrences are also listed in Table 2.10. A complete list of REs known or expected to provide habitat for these species is provided in Table 2.13.

The two undescribed land snail species included in the tables - Camaenidae BL 13 ('Brigalow Woodland Snail') and Camaenidae BL12 ('Dulacca Woodland Snail') - are to be submitted for listing under the EPBC Act as 'critically endangered' and 'endangered', respectively. Their names will be formally published in early 2010 after which the official submissions will be made. As a rule, land snails are highly specific to particular vegetation types. Hence, it is not surprising that past intense clearing of the Brigalow/woodland biotype for agriculture and pasture has severely impacted on land snail species occurring within this bioregion.

The following is a brief profile for each of these species.

#### **Camaenidae BL 13 (Brigalow Woodland Snail)**



This species is previously known from the Chinchilla area from scattered populations in remnant Brigalow/woodland vegetation. All recent records from the Talinga/Orana tenement have been collected from Brigalow

habitat on alluvial black soils. Within the study area, four new records of the species were documented from remnant Brigalow vegetation, all occurring in Land Zone 3 (alluvial soils); while a single record was collected in a non-remnant vegetation patch.

The distribution of Camaenidae BL 13 encompasses the Talinga-Orana tenement and extends east to near Lake Broadwater.

Threats include:

Land clearing: large-scale clearing of Brigalow habitat for agriculture, stock grazing.

Fire (wild): sporadic and unpredictable impact causing destruction of habitat and direct death of snails.

Fire (managed): predictable impact causing destruction of habitat and direct death of snails.

Trampling by cattle: causes direct death of snails.

Introduced predators: increased predator pressure on a small restricted population.

#### **Camaenidae BL 12 (Dulacca Woodland Snail)**



This 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 Carinya tenement. As a result of the surveys undertaken for this report, seven new records of the species have now been documented

from within the tenements in a variety of REs and non-remnant vegetation. Soil types where specimens were found include: clay plains (Land Zone 4), sandy and loamy soils (Land Zone 5), duricrust (Land Zone 7) and fine-grained sedimentary rocks (Land Zone 9).

From current records, the distribution of this species occurs north and west of that for Camaenidae BL 13 and it has a broader habitat preference than that species. Threats are as for Camaenidae BL 13.

Detailed profiles for the remaining terrestrial fauna species of special conservation significance known or considered possible occurrences within the study area are provided in the references listed in Table 2.10. Those references containing profiles specific to the BBS bioregion are in bold font. Some important texts are not included in the table as they are relevant for all species within particular species groups. These are Barker et al. (1995) and Anstis (2002) for frogs, Cogger (2000) for all frogs and reptiles, Ehmann (1992), Wilson (2005) and Wilson and Swan (2008) for all reptiles, Blakers et al. (1984) for all birds and Van Dyck and Strahan (2008) for all mammals. It should be noted that due to taxonomic changes species names may not correspond across all references and that the list is not comprehensive.

**Table 2.10. Summary of Likelihood of Occurrence of Terrestrial Fauna Species of Special Conservation Significance within the Study Area<sup>1</sup>**

Class/Family	Species Name	Common Name	Management Status2				Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M		
Species Known to Occur within the study area							
Gastropoda Camaenidae	In preparation3	Dulacca Woodland Snail Camaenidae BL 124	E5				Stanisic et al. (in preparation)
Gastropoda Camaenidae	In preparation3	Brigalow Woodland Snail Camaenidae BL 134	CE6				Stanisic et al. (in preparation)
Insecta Lycaenidae	Jalmenus eubulus	Pale Imperial Hairstreak		V			Braby (2000, 2004), Eastwood et al. (2008)
Amphibia Myobatrachidae	Limnodynastes salmini	Salmon-striped Frog		C	x		McFarland et al. (1999), EPA (2002b), Venz et al. (2002)
Amphibia Hylidae	Cyclorana verrucosa	Rough Frog		R			McFarland et al. (1999), EPA (2002b)
Reptilia Chelidae	Emydura macquarii	Macquarie Turtle		C	x		McFarland et al. (1999)
Reptilia Chelidae	Macrochelodina expansa	Broad-shelled Turtle		C	x		McFarland et al. (1999), Venz et al. (2002)
Reptilia Gekkonidae	Strophurus taenicauda	Golden-tailed Gecko		NT			McFarland et al. (1999), Drury (2001), Venz et al. (2002), Richardson (2006)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Reptilia Pygopodidae	Delma plebeia	Leaden Delma		C	x	Drury (2001)
Reptilia Pygopodidae	Delma torquata	Adorned (Collared) Delma 7	V	V		McFarland et al. (1999), Drury (2001), Richardson (2006), DEWHA (2009c)
Reptilia Pygopodidae	Paradelma orientalis	Brigalow Scaly-foot	V	V		McFarland et al. (1999), Drury (2001), Richardson (2006), EPA (2008a), DEWHA (2009c)
Reptilia Scincidae	Ctenotus ingrami	Unspotted Yellow-sided Ctenotus		C	x	McFarland et al. (1999)
Reptilia Scincidae	Cyclodomorphus gerrardii	Pink-tongued Skink		C	x	McFarland et al. (1999)
Reptilia Scincidae	Egernia rugosa	Yakka Skink	V	V		McFarland et al. (1999), Drury (2001), Richardson (2006), DEWHA (2009c)
Reptilia Scincidae	Tiliqua rugosa	Shingle-back		C	x	McFarland et al. (1999), Drury (2001), Venez et al. (2002)
Reptilia Agamidae	Chlamydosaurus kingii	Frilled Lizard		C	x	McFarland et al. (1999), Drury (2001), EPA (2002b), Venez et al. (2002)



Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Reptilia Agamidae	Physignathus lesueurii	Eastern Water Dragon		C	x	
Reptilia Varanidae	Varanus panoptes	Yellow-spotted Monitor		C	x	McFarland et al. (1999)
Reptilia Boidae	Aspidites ramsayi	Woma 7		R		Covacevich and Couper (1996), McFarland et al. (1999), Drury (2001), Richardson (2006)
Reptilia Elapidae	Acanthophis antarcticus	Common Death Adder		R		McFarland et al. (1999), Drury (2001), Venz et al. (2002), Richardson (2006)
Reptilia Elapidae	Cryptophis boschmai	Carpentaria Snake		C	x	McFarland et al. (1999), Venz et al. (2002)
Reptilia Elapidae	Furina dunmalli	Dunmall's Snake	V	V		McFarland et al. (1999), Drury (2001), Richardson (2006), DEWHA (2009c)
Reptilia Elapidae	Hemiaspis damelii	Grey Snake		E		McFarland et al. (1999), Drury (2001), Richardson (2006),
Reptilia Elapidae	Hoplocephalus bitorquatus	Pale-headed Snake		C	x	EPA (2002b)
Reptilia Elapidae	Pseudechis guttatus	Spotted Black Snake		C	x	EPA (2002b)
Aves Anatidae	Stictonetta naevosa	Freckled Duck		R		Marchant and Higgins (1990), McFarland et al. (1999), Garnett and Crowley (2000)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Anatidae	Nettapus coromandelianus	Cotton Pygmy-goose	M	R		Marchant and Higgins (1990), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), DEWHA (2009c)
Aves Columbidae	Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	V	V		Frith (1982), Crome and Shields (1992), Higgins and Davies (1996), McFarland et al. (1999), Garnett and Crowley (2000), EPA (2002b, 2008a), Venz et al. (2002), DEWHA (2009c)
Aves Apodidae	Hirundapus caudacutus	White-throated Needletail	M	S		Higgins (1999), DEWHA (2009c)
Aves Apodidae	Apus pacificus	Fork-tailed Swift	M	S		Higgins (1999)
Aves Ciconiidae	Ephippiorhynchus asiaticus	Black-necked Stork		R		Pringle (1985), Marchant and Higgins (1990), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002)
Aves Ardeidae	Ardea modesta	Eastern Great Egret	M	S		Pringle (1985), Marchant and Higgins (1990), DEWHA (2009c)
Aves Ardeidae	Ardea ibis	Cattle Egret	M	S		Pringle (1985), Marchant and Higgins (1990)
Aves Threskiornithidae	Plegadis falcinellus	Glossy Ibis	M	S		Pringle (1985), Marchant and Higgins (1990)
Aves Accipitridae	Lopholictinia isura	Square-tailed Kite		R		Marchant and Higgins (1993), Debus (1998), McFarland et al. (1999), Garnett and Crowley (2000), EPA (2002b), Venz et al. (2002)
Aves Accipitridae	Haliaeetus leucogaster	White-bellied Sea-Eagle	M	S		Marchant and Higgins (1993), Debus (1998), DEWHA (2009c)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Accipitridae	Accipiter novaehollandiae	Grey Goshawk		R		Marchant and Higgins (1993), Debus (1998), McFarland et al. (1999), EPA (2002b), Venz et al. (2002)
Aves Burhinidae	Burhinus grallarius	Bush Stone-curlew		C	x	Marchant and Higgins (1993), EPA (2002b)
Aves Rostratulidae	Rostratula australis	Australian Painted Snipe8	V, M	V		Marchant and Higgins (1993), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), Geering et al. (2007), DEWHA (2009c)
Aves Scolopacidae	Gallinago hardwickii	Latham's Snipe	M	S		Pringle (1987), Higgins and Davies (1996), Garnett and Crowley (2000), Geering et al. (2007), DEWHA (2009c)
Aves Scolopacidae	Tringa nebularia	Common Greenshank	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Tringa stagnatilis	Marsh Sandpiper	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Calidris acuminata	Sharp-tailed Sandpiper	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Cacatuidae	Calyptorhynchus lathami	Glossy Black-Cockatoo 7		V		Crome and Shields (1992), Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), EPA (2002b)
Aves Psittacidae	Neophema pulchella	Turquoise Parrot		R		Crome and Shields (1992), Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002)
Aves Strigidae	Ninox connivens	Barking Owl		C	x	Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), Hollands (2008)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Tytonidae	Tyto novaehollandiae	Masked Owl		C	x	Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), Hollands (2008)
Aves Meropidae	Merops ornatus	Rainbow Bee-eater	M	S		Higgins (1999), DEWHA (2009c)
Aves Climacteridae	Climacteris picumnus	Brown Treecreeper		C	x	McFarland et al. (1999), Garnett and Crowley (2000), Higgins et al. (2001), Venz et al. (2002), EPA (2002b, 2008a)
Aves Acanthizidae	Chthonicola sagittata	Speckled Warbler		C	x	Garnett and Crowley (2000), Higgins and Peter (2002), EPA (2002b, 2008a)
Aves Meliphagidae	Melithreptus gularis	Black-chinned Honeyeater		R		McFarland et al. (1999), Garnett and Crowley (2000), Higgins et al. (2001), Venz et al. (2002)
Aves Meliphagidae	Grantiella picta	Painted Honeyeater 7		R		McFarland et al. (1999), Garnett and Crowley (2000), Higgins et al. (2001), EPA (2002b)
Aves Pomatostomidae	Pomatostomus temporalis	Grey-crowned Babbler		C	x	Higgins and Peter (2002), Garnett and Crowley (2000)
Aves Pomatostomidae	Pomatostomus superciliosus	White-browed Babbler		C	x	McFarland et al. (1999), Higgins and Peter (2002), Garnett and Crowley (2000)
Aves Rhipiduridae	Rhipidura rufifrons	Rufous Fantail	M	S		Higgins et al. (2006a)
Aves Petroicidae	Melanodryas cucullata	Hooded Robin 7		C	x	Garnett and Crowley (2000), Higgins and Peter (2002)

mitigation measures and the assessed residual impact.

Significant ecological elements refer to those species, communities or processes that are recognised under State and Commonwealth Legislation or by planning instruments (for example, species or ecological communities listed as significant under the provisions of the EPBC Act, NC Act, and/or the VM Act, relevant priority non-EVR species, and the State and Regional Bioregional Corridors identified by the Biodiversity Planning Assessment for the Brigalow Belt South Bioregion).

For flora, assessment of the nature and scale of impacts is based on the known distribution and rarity of the ecosystem, the proportion and absolute area affected, the presence or likely presence of significant species and the likely environmental (physical, chemical, biological) changes resulting from project activities. For fauna, assessment of the nature and scale of predicted impacts is based on known or likely occurrence, fecundity, dispersal abilities, home range, habitat specialisation, resilience to disturbance and mobility. Levels of impact are assessed in relation to the following two factors: impact likelihood and consequence. Duration, and the reliability of each prediction, is identified.

The likelihood of an identified impact occurring has been rated as either 'certain', 'probable', 'possible', 'unlikely' or 'very unlikely'. The consequence of each impact is categorised as 'major', 'significant', 'moderate', 'minor' or 'negligible' in terms of its effect on the element in question. Briefly put,

- 'major' impacts would result in the extinction of a species
- 'significant' impacts may be notably detrimental or beneficial to the species or community on a population scale
- 'moderate' negative impacts may result in a substantial change to a local population

- 'minor' negative impacts may result in small decreases to a local population that would be overcome without mitigation, and
- 'negligible' impacts are those that are likely to be undetectable.

The recommended mitigation measures are designed to ensure that impacts are reduced to 'negligible' or at most 'minor' levels through the implementation of Habitat Management Guidelines or, where this cannot be achieved, through offsets. It is recommended that such guidelines be prepared and approved prior to commencement of the Project and include actions for managing individual threatened species. These would be applied to works that may affect a species of significance that is likely to be affected by some element of the Project.

- The report also identifies:
- locations of REs (and their analogous communities) recommended for avoidance
- areas where further field investigations are required to accurately locate specific, highly restricted habitats and species, and
- areas where offset actions would be most beneficial are identified.

### Terrestrial Vegetation and Flora

The most intensive and long term impacts on conservation significant vegetation communities and flora species would result from the proposed clearing of approximately 6,000ha of remnant vegetation and the ongoing degradation of habitats through edge effects and fragmentation. While no RE would lose more than 0.53% of its extent within the relevant bioregional provinces, the potential for clearing to further fragment habitats within the study area has significance for a number of flora and fauna species which are highly geographically restricted or occur sparsely throughout their distribution.

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Acrocephalidae	Acrocephalus australis	Australian Reed-Warbler	M	S		Higgins et al. (2006b)
Aves Estrilidae	Stagonopleura guttata	Diamond Firetail 7		C	x	Garnett and Crowley (2000), EPA (2002b), Higgins et al. (2006b)
Mammalia Dasyuridae	Phascogale tapoatafa	Brush-tailed Phascogale		C	x	Maxwell et al. (1996), McFarland et al. (1999)
Mammalia Dasyuridae	Planigale tenuirostris	Narrow-nosed Planigale		C	x	McFarland et al. (1999), EPA (2008a)
Mammalia Phascolarctidae	Phascolarctos cinereus	Koala		C	x	Maxwell et al. (1996), McFarland et al. (1999), Venz et al. (2002), EPA (2002b, 2008a)
Mammalia Petauridae	Petaurus australis	Yellow-bellied Glider 7		C	x	Maxwell et al. (1996), McFarland et al. (1999), Venz et al. (2002), EPA (2002b, 2008a)
Mammalia Petauridae	Petaurus norfolcensis	Squirrel Glider		C	x	Maxwell et al. (1996), McFarland et al. (1999), Venz et al. (2002)
Mammalia Pseudocheiridae	Petauroides volans	Greater Glider		C	x	McFarland et al. (1999), Venz et al. (2002), EPA (2002b)
Mammalia Phalangeridae	Trichosurus vulpecula	Common Brushtail Possum		C	x	EPA (2002b, 2008a)
Mammalia Potoroidae	Aepyprymnus rufescens	Rufous Bettong		C	x	EPA (2002b)



Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Mammalia Macropodidae	Macropus dorsalis	Black-striped Wallaby		C	x	EPA (2002b)
Mammalia Vespertilionidae	Chalinolobus picatus	Little Pied Bat		R		Duncan et al. (1999), McFarland et al. (1999), Venz et al. (2002), Churchill (2008), EPA (2008a)
Mammalia Vespertilionidae	Nyctophilus corbeni (formerly timoriensis) 9	South-eastern Long-eared Bat	V	V		Duncan et al. (1999), McFarland et al. (1999), Venz et al. (2002), EPA (2008a)
Species considered Marginal within the study area						
Insecta Lycaenidae	Hypochrysops piceata	Bulloak Jewell Butterfly		E		Braby (2000, 2004)
Aves Accipitridae	Pandion cristatus	Eastern Osprey	M	S		Marchant and Higgins (1993), Debus (1998), DEWHA (2009c)
Aves Accipitridae	Erythrotriorchis radiatus	Red Goshawk 7	V	E		Marchant and Higgins (1993), Debus (1998), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), DEWHA (2009c)
Aves Falconidae	Falco hypoleucos	Grey Falcon		R		Marchant and Higgins (1993), Debus (1998), Olsen (1998), McFarland et al. (1999), Garnett and Crowley (2000)
Aves Rallidae	Lewinia pectoralis	Lewin's Rail		R		Marchant and Higgins (1993), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002)
Aves Charadriidae	Pluvialis fulva	Pacific Golden Plover	M	S		Pringle (1987), Marchant and Higgins (1993), Geering et al. (2007)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Scolopacidae	Limosa limosa	Black-tailed Godwit	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Actitis hypoleucos	Common Sandpiper	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Tringa glareola	Wood Sandpiper	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Calidris ruficollis	Red-necked Stint	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Calidris ferruginea	Curlew Sandpiper	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Turnicidae	Turnix melanogaster	Black-breasted Button- quail 7	V	V		Marchant and Higgins (1993), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), DEWHA (2009c)
Aves Laridae	Hydroprogne caspia	Caspian Tern	M	S		Pringle (1987), Higgins and Davies (1996)
Aves Psittacidae	Lathamus discolor	Swift Parrot	E	E		Crome and Shields (1992), Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), DEWHA (2009c)
Aves Tytonidae	Tyto longimembris	Eastern Grass Owl		C	x	Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), Hollands (2008)
Aves Monarchidae	Myiagra cyanoleuca	Satin Flycatcher	M	S		Higgins et al. (2006a)

Class/Family	Species Name	Common Name	Management Status <sup>2</sup>			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Mammalia Ornithorhynchidae	Ornithorhynchus anatinus	Platypus		C	x	McFarland et al. (1999), Venz et al. (2002), EPA (2008a)
Mammalia Peramelidae	Isodon macrourus	Northern Brown Bandicoot		C	x	McFarland et al. (1999), Venz et al. (2002), EPA (2002b)
Mammalia Peramelidae	Perameles nasuta	Long-nosed Bandicoot		C	x	McFarland et al. (1999), Venz et al. (2002), EPA (2002b, 2008a)
Mammalia Pseudocheiridae	Pseudocheirus peregrinus	Common Ringtail Possum		C	x	McFarland et al. (1999), EPA (2002b)
Mammalia Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox 7	V	C		Duncan et al. (1999), McFarland et al. (1999), EPA (2008a), DEWHA (2009c)
Mammalia Vespertilionidae	Chalinolobus dwyeri	Large-eared Pied Bat	V	V		Duncan et al. (1999), McFarland et al. (1999), Churchill (2008), EPA (2008a), DEWHA (2009c)
Mammalia Vespertilionidae	Miniopterus orianae oceanensis 10	Eastern Bentwing Bat		C	x	Churchill (2008), EPA (2008a)
Mammalia Muridae	Pseudomys patrius	Eastern Pebble-mouse		C	x	EPA (2008a)
Species considered as Vagrants within the study area						
Aves Pedionomidae	Pedionomus torquatus	Plains-wanderer	V	V		Marchant and Higgins (1993), McFarland et al. (1999), Garnett and Crowley (2000), Geering et al. (2007), DEWHA (2009c)

Class/Family	Species Name	Common Name	Management Status2			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Aves Scolopacidae	Limosa lapponica	Bar-tailed Godwit	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Numenius phaeopus	Whimbrel	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Scolopacidae	Philomachus pugnax	Ruff	M	S		Pringle (1987), Higgins and Davies (1996), Geering et al. (2007)
Aves Cacatuidae	Lophochroa leadbeateri	Major Mitchell's Cockatoo 7		V		Crome and Shields (1992), Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000)
Aves Monarchidae	Monarcha melanopsis	Black-faced Monarch	M	S		Higgins et al. (2006a)
Species Not Expected to Occur within the study area						
Amphibia Myobatrachidae	Uperoleia fusca	Dusky Toadlet		C	x	McFarland et al. (1999)
Reptilia Chelidae	Rheodytes leukops	Fitzroy Turtle 7	V	V		McFarland et al. (1999), Venz et al. (2002), DEWHA (2009c)
Reptilia Scincidae	Anomalopus mackayi	Five-clawed Worm-skink 7	V	E		McFarland et al. (1999), Drury (2001), Venz et al. (2002), DEWHA (2009c)
Reptilia Agamidae	Amphibolurus muricatus	Jacky Lizard		C	x	McFarland et al. (1999)

Class/Family	Species Name	Common Name	Management Status <sup>2</sup>			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Reptilia Agamidae	Tympanocryptis pinguicollis	Grassland Earless Dragon 7	E	E		McFarland et al. (1999), Drury (2001), Richardson (2006), DEWHA (2009c)
Reptilia Elapidae	Denisonia maculata	Ornamental Snake	V	V		McFarland et al. (1999), Drury (2001), Venz et al. (2002), Richardson (2006), DEWHA (2009c)
Aves Fregatidae	Fregata ariel	Lesser Frigatebird	M	S		Marchant and Higgins (1990)
Aves Psittacidae	Polytelis swainsonii	Superb Parrot	V			Crome and Shields (1992), Higgins (1999), Garnett and Crowley (2000), DEWHA (2009c)
Aves Strigidae	Ninox strenua	Powerful Owl		V		Higgins (1999), McFarland et al. (1999), Garnett and Crowley (2000), Venz et al. (2002), Hollands (2008)
Aves Meliphagidae	Anthochaera phrygia	Regent Honeyeater 11	E, M	E		McFarland et al. (1999), Garnett and Crowley (2000), Higgins et al. (2001), Venz et al. (2002), DEWHA (2009c)
Aves Estrilidae	Poephila cincta cincta	Black-throated Finch (southern subspecies) 7	E	E		Garnett and Crowley (2000), Higgins et al. (2006b)
Aves Estrilidae	Neochmia ruficauda ruficauda	Star Finch (eastern subspecies)	E	E		Garnett and Crowley (2000), Higgins et al. (2006b), DEWHA (2009c)
Mammalia Dasyuridae	Dasyurus hallucatus	Northern Quoll	E	C		Maxwell et al. (1996), McFarland et al. (1999), Venz et al. (2002)
Mammalia Dasyuridae	Dasyurus maculatus	Spot-tailed Quoll 7	E	V		Maxwell et al. (1996), McFarland et al. (1999), DEWHA (2009c)

Class/Family	Species Name	Common Name	Management Status <sup>2</sup>			Species Profiles (References in bold are specific to BBS)
			EPB C Act	NC Act	BAM M	
Mammalia Vombatidae	Lasiorninus krefftii	Northern Hairy-nosed Wombat 7	E	E		Maxwell et al. (1996), DEWHA (2009c)
Mammalia Megadermatidae	Macroderma gigas	Ghost Bat 7		V		Duncan et al. (1999), Churchill (2008)
Mammalia Vespertilionidae	Chalinolobus nigrogriseus	Hoary Wattled Bat		C	x	Churchill (2008), EPA (2008a)
Mammalia Vespertilionidae	Miniopterus australis	Little Bentwing Bat		C	x	EPA (2002b, 2008a), Churchill (2008)
Mammalia Vespertilionidae	Vespadelus regulus	Southern Forest Bat		C	x	Churchill (2008)

<sup>1</sup> A detailed account of potential occurrence is provided in **Table J.2 of Appendix J**.

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

<sup>3</sup> Undescribed species, description will be published in 2010 in Stanisic *et al.* (in preparation).

<sup>4</sup> Undescribed species, alpha-numeric code is as cited in Queensland Museum database.

<sup>5</sup> Currently under submission to DEWHA for listing under the EPBC Act as Endangered.

<sup>6</sup> Currently under submission to DEWHA for listing under the EPBC Act as Critically Endangered.

<sup>7</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>8</sup> Listed as Migratory under the EPBC Act as Painted Snipe *Rostratula benghalensis* s. lat.

<sup>9</sup> Very recently described as *Nyctophilus corbeni* (Parnaby 2009).

<sup>10</sup> Listed in the Australian Faunal Directory as Eastern Bent-wing Bat *Miniopterus schreibersii oceanensis*

<sup>11</sup> Listed as Migratory under the EPBC Act as *Xanthomyza phrygia*.



Table 2.11. Terrestrial Fauna Species of Special Conservation Significance Detected within the Study Area during the 2009 Ground Surveys

Class	Species Name	Common Name	Status1			Details
			EPBC Act	NC Act	BAMM	
Land Snails	In preparation2	Dulacca Woodland Snail Camaenidae BL123	E4			Five records, all in the Carinya tenement.
	In preparation2	Brigalow Woodland Snail Camaenidae BL133	CE5			Five records, including three in the Talinga and Orana tenements and another just west of the Condabri tenement.
Frogs	Limnodynastes salmini	Salmon-striped Frog		C	x	Two records within the Gilbert Gully tenement.
Reptiles	Strophurus taenicauda	Golden-tailed Gecko		NT		Numerous records from the Combabula/Ramyard tenement and additional records from the Carinya, Dalwogan, Condabri and Talinga/Orana tenements.
	Paradelma orientalis	Brigalow Scaly-foot	V	V		One record (skin) from the Combabula/Ramyard tenement.
	Ctenotus ingrami	Unspotted Yellow-sided Ctenotus		C	x	Two records within the Gilbert Gully tenement, and another within the Combabula/Ramyard tenement.
	Tiliqua rugosa	Shingle-back		C	x	Four records from the Carinya tenement and another just east of the Gilbert Gully tenement at Millmerran.
Birds	Varanus panoptes	Yellow-spotted Monitor		C	x	Three records within the Combabula/Ramyard tenement, and another within the Carinya tenement.
	Hoplocephalus bitorquatus	Pale-headed Snake		C	x	One record from the Combabula/Ramyard tenement.
	Geophaps scripta scripta	Squatter Pigeon (southern subsp.)	V	V		One record from the Combabula/Ramyard tenement.
	Ephippiorhynchus asiaticus	Black-necked Stork		R		One record from the Talinga/Orana tenement.

Class	Species Name	Common Name	Status1			Details
			EPBC Act	NC Act	BAMM	
Mammals	<i>Ardea modesta</i>	Eastern Great Egret	M	S		One record each from the Combabula/Ramyard, Carinya, Condabri and Talinga/Orana tenements.
	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	M	S		One record from the Talinga/Orana tenement.
	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo		V		Bird sightings and numerous feeding records from the Combabula/Ramyard and Woleebee tenements, and additional feeding records from the Carinya, Talinga/Orana and Gilbert Gully tenements.
	<i>Neophema pulchella</i>	Turquoise Parrot		R		One record from the Talinga/Orana tenement and another just east of the Gilbert Gully tenement at Millmerran.
	<i>Ninox connivens</i>	Barking Owl		C	x	Three records from the Woleebee tenement.
	<i>Chthonicola sagittata</i>	Speckled Warbler		C	x	Numerous records from the Combabula/Ramyard tenement and additional records from the Dalwogan, Condabri, Talinga/Orana, Kainama and Gilbert Gully tenements.
	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler		C	x	Numerous records from the Combabula/Ramyard, Carinya, Condabri, Talinga/Orana and Gilbert Gully tenements and additional records from the Woleebee, Dalwogan and Kainama tenements.
	<i>Melanodryas cucullata</i>	Hooded Robin		C	x	Two records within the Gilbert Gully tenement.
	<i>Phascogaleos cinereus</i>	Koala		C	x	Two records (scats/scratches) within the Talinga/Orana tenement, and another within the Condabri tenement.
	<i>Trichosurus vulpecula</i>	Common Brushtail Possum		C	x	Records from the Combabula/Ramyard, Woleebee, Carinya, Condabri and Talinga/Orana tenements.
	<i>Aepyprymnus rufescens</i>	Rufous Bettong		C	x	Record from the Combabula/Ramyard, Carinya, Dalwogan, and

Class	Species Name	Common Name	Status <sup>1</sup>			Details
			EPBC Act	NC Act	BAMM	
						Talinga/Orana tenements.
	Macropus dorsalis	Black-striped Wallaby		C	x	Record from the Combabula/Ramyard, Woleebee, Carinya, Talinga/Orana and Gilbert Gully tenements.
	Chalinolobus picatus	Little Pied Bat		R		Two records each from the Combabula/Ramyard, Woleebee, Condabri and Talinga/Orana tenements.

<sup>1</sup> Status abbreviations are as follows: E = Endangered, V = Vulnerable, R = Rare, NT = Near Threatened, M = Migratory, S = Special Least Concern, C = Least Concern Wildlife, X = non-EVR priority species for the BBS bioregion.

<sup>2</sup> Undescribed species, description will be published in 2010 in Stanisic et al. (in preparation).

<sup>3</sup> Undescribed species, alpha-numeric code is as cited in Queensland Museum database.

<sup>4</sup> Currently under submission to DEWHA for listing under the EPBC Act as Endangered.

<sup>5</sup> Currently under submission to DEWHA for listing under the EPBC Act as Critically Endangered.