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Toro Energy Limited - Extension to the Wiluna Uranium Project
Flora and Vegetation Consolidation and Conservation Assessment

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

In 2012 and 2013 Toro Energy Limited (Toro) was granted State and Commonwealth approval for implementation of the “Wiluna Uranium Project” which is based on mining Uranium at two locations, the Centipede and Lake Way deposits.

Toro has recently acquired two more deposits, Millipede and Lake Maitland, and is seeking environmental approvals for mining of these deposits, as well as for the development of a haul road and a water supply borefield. The two satellite pits, together with the borefield and the haul road are known as the “Extension to the Wiluna Uranium Project”. The Wiluna Uranium Project and Extension to the Wiluna Uranium Project (study area) are shown in Figure 1.1.

The Extension to the Wiluna Uranium Project is located on Barwidgee and Lake Way Stations, with the northern end (Millipede deposit) located approximately 25 km south-east of Wiluna and the southern end (Lake Maitland deposit), located approximately 100 km south-east of Wiluna, and an 80 km haul road connecting the two. The Wiluna Uranium Project is located on Lake Way Station, with the northern end (Lake Way deposit) located approximately 10 km south-east of Wiluna and the southern end (Centipede deposit) located directly east of the Millipede deposit, and includes a road connecting the two and the West Creek Borefield, located approximately 6 km south of Wiluna (Figure 1.1).

Based on comments received from the Office of the Environmental Protection Authority (OEPA) on the draft Environmental Scoping Document for the extension to the Wiluna Uranium Project, Toro commissioned ecologia Environment (ecologia) to undertake an analysis of the flora taxa and vegetation communities occurring at the study area. This report has also been revised to address responses to public submissions to Toro’s Public Environmental Review for the Extension to the Wiluna Uranium Project.
The Wiluna Uranium Project and the Extension to the Wiluna Uranium Project

Legend
- Wiluna Uranium Project Development Envelope
- Extension to the Wiluna Uranium Project Development Envelope

Tecticornia dominated communities
- Lake Maitland
- Lake Way

Figure: 1.1
Project ID: 1625
Drawn: MY
Date: 19/04/2016

Legend
Wiluna Uranium Project Development Envelope
Extension to the Wiluna Uranium Project Development Envelope

Tecticornia dominated communities
Lake Maitland
Lake Way
2 LITERATURE REVIEW

2.1 PREVIOUS FLORA AND VEGETATION SURVEYS

2.1.1 Lake Way and Centipede (Outback Ecology 2007)
A Level 2 flora and a vegetation assessment was conducted during October 2007 for the Lake Way and Centipede Deposits as part of the Wiluna Uranium Project (Outback Ecology 2007). The survey included 108 quadrats (each 30 x 30 m) and sampled 132 vascular flora taxa with no significant flora recorded (Table 2.1). The introduced *Lysimachia arvensis* was recorded (as *Anagallis arvensis*) from one location at the Lake Way Deposit. Twenty-two vegetation units were described, including significant vegetation units: Me1 (*Melaleuca xerophila* mid density low forest) which is generally restricted to a narrow band along the lake edge; and halophytic vegetation which is considered significant due to unique community assemblages. Outback Ecology concluded that the following vegetation units are of conservation significance:

- **Ha1** (*Halosarcia indica* subsp. *leiostachya* and *Halosarcia auriculata* dense low heath over *Eragrostis* spp. very sparse grass). Ha1 was recorded at eight quadrats at Centipede Deposit and one quadrat at the Lake Way Deposit.
- **Ha2** (*Halosarcia indica* subsp. *bidens*, *Atriplex bunburyana* and *Frankenia* sp1 mid density low heath). Ha2 was recorded at a single quadrat associated with a drainage channel flowing into Lake Way at the Lake Way Deposit.
- **Ha3** (*Halosarcia* spp., *Frankenia* spp. mid density low heath over *Eragrostis* spp. and *Aristida contorta* sparse open grass). Ha3 was recorded at six quadrats at the Lake Way Deposit and one quadrat at the Centipede Deposit.
- **Te1** (*Tecticornia tenuis* and *Halosarcia auriculata* mid density low heath over *Eragrostis* spp. very sparse grass). Te1 was recorded at two quadrats at the Centipede Deposit and two quadrats at the Lake Way Deposit.
- **Te2** (*Tecticornia arbuscula*, *Maireana amoena* and mixed species sparse dwarf scrub over *Triodia melvillei* sparse hummock grass and *Eragrostis* spp. sparse grass). Te2 was recorded at three quadrats from a chain of claypans to the east of the Lake Way Deposit.
- **Fr1** (*Frankenia* spp. and *Muellerolimon salicorniaceum* and mixed species low density heath over *Aristida contorta* sparse grass). Fr1 was recorded at one quadrat at the Lake Way Deposit.
- **Fr2** (*Frankenia* spp. and *Halosarcia calyptrata* mid density low heath over *Eragrostis* spp. very sparse grass). Fr2 was recorded from one quadrat at Centipede Deposit.
- **La1** (*Lawrencia helmsii* and *Halosarcia indica* subsp. *leiostachya* very sparse dwarf scrub over *Pililotus obovatus* var. *obovatus* very sparse herbs over *Eragrostis* spp. very open grass). La1 was recorded at one quadrat associated with a claypan at the Centipede Deposit and two quadrats from claypans at the Lake Way Deposit.
- **Ly1** (*Lycium australe*, *Cratystylis spinascens* and mixed species mid density heath over *Eragrostis* spp. mid density grass). Ly1 was recorded from one quadrat from a claypan at the Lake Way Deposit.

2.1.2 Lake Maitland (Outback Ecology 2009)
A Level 2 flora and a vegetation assessment was conducted during May 2007, November 2007 and May 2009 for the Mega Uranium Lake Maitland project (Outback Ecology 2009). The survey included 91 quadrats (each 30 x 30 m) and sampled 244 vascular flora taxa with one potential Priority 3 flora taxon (*Maireana ?prosthecochaeta*) and five range extensions (*Acacia aneura* var. cf. *major*, *Acacia*
brumalis, Acacia maxwellii, Acacia sclerochoda and Sida kingii). The introduced taxon, *Tribulus terrestris was recorded from one location at Lake Maitland. Thirty-one vegetation units were described, including significant vegetation unit KRE (Low woodland of Eucalyptus striaticalyx and Grevillea sarissa subsp. bicolor over low scrub of Lawrencia helmsii, Sclerolaena fimbriolata and Tecticornia aff. undulata.) which is restricted to several areas to the south of Lake Maitland (Table 2.1).

### 2.1.3 Lake Way, Centipede and West Creek Borefield (Niche 2011)

A Level 2 flora and a vegetation assessment was conducted during April 2010, June 2010 and September/October 2010 for Lake Way, Centipede and West Creek Borefield Deposits as part of the Toro Wiluna Uranium Project (Niche 2011). The survey included 264 (30 x 30 m) quadrats (including resampling of the Lake Way and Centipede quadrats from the Outback Ecology (2007) survey). Niche recorded 428 vascular flora taxa, including six Priority flora taxa (two Priority 1 taxa: Eremophila congesta and Tecticornia sp. Lake Way, and four Priority 3 taxa: Eremophila arachnoides subsp. arachnoides, Stackhousia clementii, Homalocalyx echinulatus and Mirbelia stipitata), twenty-four range extensions (Brachyscome iberidifolia, *Centaura melitensis, Cratystylis subspinescens, Cynanchum floribundum, Dicrastylis doranii, Disphyma crassifolium subsp. clavellatum, Dysphania truncata, Euphorbia bicornexa, Frankenia interioris, Frankenia sp. cf. glomerata, Gnephosis angiantoides, ?Gompholobium simplicifolium (as ?Otion simplicifolium), Gunniopsis rodwayi, Gunniopsis septifraga, Isoetopsis graminifolia, Maireana amoena, Maireana appressa, Murchisonia volubilis, Nicotiana rotundifolia, Polygala isingii, Ptilotus murrayi, Scaevola tomentosa, Senna manicula and Trachymene ceratocarpa) and four atypical variants (Frankenia ?interioris and Frankenia sp. cf. glomerata, which are also listed above as range extensions, and Scaevola spinescens and Rhagodia drummondii). Four introduced flora species (*Acetosa vesicaria, *Brassica tournefortii, *Centaura melitensis and *Sonchus aleraceus) were also recorded (Table 2.1).

Thirty-four vegetation units were described, including the following seven potentially significant vegetation units:

- **BIF** (Open low woodland of *Acacia aneura* var. *aneura*) occurs in the West Creek Borefield and is considered potentially significant as it is restricted to banded ironstone formation and is suitable habitat for the Priority 1 *Eremophila congesta*.

- **Ca1** (Open low woodland of *Eucalyptus gypsophila*) is considered significant as it provides habitat for the Priority 3 *Eremophila arachnoides* subsp. *arachnoides* and as calccrete vegetation of the north-eastern goldfields is considered at risk from grazing, feral animals (goats) or changed fire regimes (Cowan 2001).

- **Ca2** (Low woodland of *Acacia* species) is considered significant as it provides habitat for the Priority 3 *Eremophila arachnoides* subsp. *arachnoides* and as calccrete vegetation of the north-eastern goldfields is considered at risk from grazing, feral animals (goats) and changed fire regimes (Cowan 2001).

- **Cr** (Woodland of *Eucalyptus camaldulensis* subsp. *obtusa*) is associated with West Creek in the West Creek Borefield. Cr is considered potentially significant as it is restricted to an area of 32 ha associated with West Creek.

- **Fr1** (Fringing closed low forest of *Melaleuca xerophila*) occurs along the margin of Lake Way at both the Lake Way and Centipede Deposits. Fr1 is considered at risk from changed fire regimes (Cowan 2001).

- **Sh complex** (includes vegetation units: Sh1: Open low woodland of *Acacia* species; Sh2: Low woodland of *Acacia aneura* var. *aneura*; Sh3: Low forest of *Acacia rhodophloia*; Sh4: Low woodland of *Acacia ayersiana*; Sh5: Low open woodland of *Acacia aneura* var. *aneura*; and
2.1.4  **Tecticornia review (Actis 2012)**

The *Tecticornia* specimens collected during the surveys supporting the Lake Way, Centipede and West Creek Borefield flora and vegetation assessment (Niche 2011) were identified by Dr. Kelly Shepherd (Senior Research Scientist at the Western Australian Herbarium, Department of Parks and Wildlife) and reports and data reviewed by Samphire specialist Bindy Datson (Actis 2012). A total of 231 specimens were collected from the salt lakes, including 168 *Tecticornia* specimens. These specimens represented 21 *Tecticornia* taxa, including 16 recognised taxa (species, subspecies or phrase name taxa), two of which are Priority flora:

- *Tecticornia* sp. Lake Way (P. Armstrong 05/961) (Priority 1); and
- *Tecticornia cymbiformis* (Priority 3).

An additional five unrecognised (potentially new) taxa were also recorded:

- *Tecticornia* sp. aff. *laevigata*;
- *Tecticornia* sp. aff. *pruinosa*;
- *Tecticornia* sp. aff. *undulata*;
- *Tecticornia* sp. *halocnemoides* beaked seed aggregate; and
- *Tecticornia* sp. nov.

Three vegetation units described in Niche (2011) were identified in Actis (2012) as being potentially groundwater dependent:

- Fr1 (Fringing *Melaleuca xerophila*);
- Cp2 (Dwarf scrub *Cratystylis subspinescens*); and
- Sl1 (Low Heath D *Tecticornia* spp.)

2.1.5  **Millipede (Niche 2014)**

A Level 2 flora and a vegetation assessment was conducted in April 2010, June 2010, September/October 2010 and October 2013 for Millipede Deposit as part of the Toro Wiluna Uranium Project (Niche 2014). The survey included 30 quadrats (30 x 30 m) which recorded 185 vascular flora taxa and included two Priority flora taxa (both Priority 3 taxa: *Eremophila arachnoides* subsp. *arachnoides* and *Stackhousia clementii*). No introduced flora species were recorded. Ten vegetation units were described, including two significant vegetation units: Ca1 (Low woodland of *Acacia* species) which is considered to be of significance due to the presence of the Priority 3 *Eremophila arachnoides* subsp. *arachnoides*; and Sl (Low heath of *Tecticornia* species) which is considered to be of significance due to the presence of potentially new (undescribed) species and the presence of the Priority 3 *Stackhousia clementii* (Table 2.1).

2.1.6  **Millipede to Lake Maitland Haul Road (ecologia 2015c)**

A Level 2 flora and a vegetation assessment was conducted in June 2014, October 2014, January 2015 and March 2015 of the haul road alignment between the Millipede and Lake Maitland Deposits as part of the Toro Extension to the Wiluna Uranium Project (ecologia 2015c). The survey included 130 quadrats (30 x 30 m) which recorded 223 vascular flora taxa and included five Priority flora taxa (three Priority 3 taxa: *Cratystylis centralis*, *Stackhousia clementii* and *Tecticornia cymbiformis*, and...
two Priority 4 taxa: *Eremophila pungens* and *Frankenia confusa*. Three introduced flora species were recorded (*Bidens bipinnata*, *Cucumis ?lanatus* and *Tribulus terrestris*).

Twelve vegetation units were described, including two significant *Tecticornia* vegetation units: S (*Tecticornia* spp., *Frankenia cinerea*, *Maireana villosa* and *Atriplex amnicola* sparse low shrubland) and V (*Tecticornia* spp., *Cratystylis subspinescens*, *Maireana amoena* and *Sclerolaena diacantha* sparse mid shrubland, over *Eragrostis falcata* sparse tussock grassland) which are considered to be of significance due to the presence of potentially new (undescribed) species and restricted distribution (Table 2.1). All *Tecticornia* specimens from this assessment were provided to Dr. Kelly Shepherd (Senior Research Scientist at the Western Australian Herbarium, Department of Parks and Wildlife) for identification however the identifications had not been completed at the time that *ecologia* prepared this report and were therefore further discussed in *ecologia’s* (2015a) *Tecticornia* assessment (see section 2.1.7).

2.1.7 Assessment of *Tecticornia* Communities of Lake Way and Lake Maitland (*ecologia* 2015a)

A *Tecticornia* assessment was conducted at Lake Way and Lake Maitland in November 2014 and January 2015 as part of the Toro Extension to the Wiluna Uranium Project (*ecologia* 2015a). The survey included the identification of 134 specimens from 162 quadrats (3 x 3 m) as well as 77 specimens for the haul road survey (*ecologia* 2015c). All *Tecticornia* specimens were provided to Dr. Kelly Shepherd (Senior Research Scientist at the Western Australian Herbarium, Department of Parks and Wildlife) for identification. Thirty-five *Tecticornia* entities were recorded at or in the vicinity of the study area, which included:

Three Priority flora:
- *Tecticornia* sp. *Lake Way* (P. Armstrong 05/961) (Priority 1);
- *Tecticornia* sp. *Sunshine Lake* (K.A. Shepherd et al. KS 867) (Priority 1); and
- *Tecticornia* cymbiformis (Priority 3).

Seven novel *Tecticornia* species:
- *Tecticornia* aff. halocnemoides s.l. 'large ovate seed aggregate';
- *Tecticornia* aff. halocnemoides s.l. 'tuberculate seed';
- *Tecticornia* sp. aff. Burnerbinmah (inflated fruit);
- *Tecticornia* sp. aff globulifera (small);
- *Tecticornia* sp. aff laevigata (non-rotated fruitlets);
- *Tecticornia* sp. aff pruinosa (inflated bracts); and
- *Tecticornia* sp. aff. undulata (broad articles).

Seven potentially novel taxa:
- ?*Tecticornia* sp. aff. globulifera (small);
- *Tecticornia* aff. halocnemoides (unusual epidermis);
- *Tecticornia* sp. aff. laevigata;
- *Tecticornia* sp. aff. pruinosa;
- *Tecticornia* sp. aff. undulata;
- *Tecticornia* sp. halocnemoides beaked seed aggregate; and
- *Tecticornia* sp. Nov.

Four range extensions:
- *Tecticornia halocnemoides subsp. catenulata*;
Tecticornia moniliformis;
Tecticornia pterygosperma subsp. pterygosperma; and
Tecticornia tenuis.

Nine Tecticornia complexes were described, which are considered to be of significance due to the presence of potentially new (undescribed) species and/or restricted distribution (Table 2.1).

- **T1:** Tecticornia laevigata, T. sp. aff globulifera (small) and T. sp. aff. undulata (broad articles) sparse low shrubland;
- **T2:** Tecticornia peltata, T. sp. aff globulifera (small), T. sp. aff. undulata (broad articles) and T. sp. Sunshine Lake (K.A. Shepherd et al. KS 867) sparse low shrubland;
- **T3:** Tecticornia sp. Dennys Crossing (K.A. Shepherd & J. English KS 552) (+/- T. indica, T. sp. aff. undulata (broad articles), T. sp. aff globulifera (small) and T. sp. Sunshine Lake (K.A. Shepherd et al. KS 867)) sparse low shrubland;
- **T4:** Tecticornia sp. Burnerbinmah (D. Edinger et al. 101) and T. sp. aff globulifera (small) (+/- T. indica subsp. leiostachya and T. aff halocnemoides s.l. 'large ovate seed aggregate') sparse low shrubland;
- **T5:** Melaleuca xerophila tall sparse shrubland, over T. cymbiformis, Dissocarpus paradoxus, and Frankenia laxiflora low shrubland, over Enneapogon caerulescens and Eragrostis dielsii sparse tussock grassland;
- **T6:** Frankenia fecunda (glabrous leaf variant) and T. disarticulata (+/- T. indica subsp. bidens) low sparse shrubland, over Aristida holathera and Eragrostis falcata sparse tussock grassland;
- **T7:** Cratystylis subspinescens, Maireana amoena and Sclerolaena diacantha (+/- T. laevigata and T. indica) sparse mid shrubland, over Eragrostis falcata sparse tussock grassland;
- **T8:** Tecticornia spp. (T. indica subsp. bidens, T. sp. aff pruinosa, T. laevigata, T. sp. aff. undulata, T. peltata and T. sp. halocnemoides (beaked seed aggregate) sparse low shrubland; and
- **T9:** Acacia victoriae and Melaleuca xerophila scattered tall shrubs, over Lycium australe and Cratystylis subspinescens sparse mid shrubland, over Tecticornia spp. (T. indica subsp. bidens, T. sp. aff pruinosa, T. laevigata, T. sp. aff. undulata, T. peltata and T. sp. halocnemoides (beaked seed aggregate) sparse low shrubland.
Table 2.1 — Summary of flora and vegetation assessments conducted in the area

<table>
<thead>
<tr>
<th>Reference</th>
<th>Report</th>
<th>Timing</th>
<th>Quadrats (size)</th>
<th>Taxa (genera/families)</th>
<th>Significant flora</th>
<th>Significance</th>
<th>Introduced flora</th>
</tr>
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<tbody>
<tr>
<td>Outback Ecology (2007)</td>
<td>Lake Way and Centipede flora and vegetation</td>
<td>Oct 2007</td>
<td>108 (30x30 m)</td>
<td>132 (65/32)</td>
<td>None reported</td>
<td>22</td>
<td>Me1 Halophytic vegetation; Restricted</td>
</tr>
<tr>
<td>Niche (2011)</td>
<td>Lake Way, Centipede and West Creek Borefield flora and vegetation</td>
<td>Apr/Jun 10-Sep/Oct 10</td>
<td>264 (30x30 m)</td>
<td>428 (161/57)</td>
<td><em>Eremophila congesta</em> (P1) <em>Tecticornia</em> sp. Lake Way (P1) <em>Eremophila arachnoides</em> subsp. arachnoides (P3) <em>Stackhousia clementii</em> (P3) <em>Homaloalcyx echinulatus</em> (P3) <em>Mirbelia stipitata</em> (P3) 24 range extensions and 4 atypical variants</td>
<td>34</td>
<td>BIF Ca1 Ca2 Cr Fr1 Sh complex SI1 Priority flora; <em>Acetosa vesicaria</em> <em>Brassica tournefortii</em> <em>Centauraea melitensis</em> <em>Sonchus oleraceus</em></td>
</tr>
<tr>
<td>Actis (2012)</td>
<td>Tecticornia review</td>
<td>As for Niche (2011)</td>
<td></td>
<td></td>
<td>Tecticornia sp. Lake Way (P1) Tecticornia cymbiformis (P3) 5 potentially undescribed Tecticornia taxa</td>
<td>-</td>
<td>Fr1 SI1 Cp2 Potential GDE Potential GDE -</td>
</tr>
<tr>
<td>Niche (2014)</td>
<td>Millipede flora and vegetation</td>
<td>Apr/Jun 10-Sep/Oct 10-Oct 2013</td>
<td>30 (30x30 m)</td>
<td>185 (100/40)</td>
<td><em>Eremophila arachnoides</em> subsp. <em>Stackhousia clementii</em> (P3)</td>
<td>10</td>
<td>Ca1 Tecticornia; Priority flora; Sig. Flora None reported</td>
</tr>
<tr>
<td>ecologia (2015a)</td>
<td>Lake Way and Lake Maitland Tecticornia</td>
<td>Nov 2014-Jan 2015</td>
<td>162 (3x3 m) along 15 transects</td>
<td>65 (27/11)</td>
<td>Tecticornia sp. Lake Way (P1) Tecticornia sp. Sunshine Lake (P1) Tecticornia cymbiformis (P3) 7 new Tecticornia taxa, 6 potentially new, 4 range extensions</td>
<td>9</td>
<td>All Tecticornia communities Restricted, Sig. Flora, Unknown None reported</td>
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Note: unique = vegetation containing a unique combination of species; new species, sig. flora, Priority Flora & unknown = presence of flora of conservation significance within vegetation unit; GDE = Groundwater Dependent Ecosystem; Restricted = vegetation unit potentially restricted in distribution; At risk = based on Cowen (2001) changes to fire regimes.
2.1.8 Beard vegetation mapping

The vegetation of Western Australia was originally mapped at the 1:1,000,000 scale by Beard (1976) and was subsequently reinterpreted and updated to reflect the National Vegetation Information System (NVIS) standards (Shepherd et al. 2001).

Thirteen vegetation associations have been mapped within the study area. These are described in Table 2.2 and shown in Figure 2.1. Of these, unit 125 (Bare areas; salt lakes) and 560 (Mosaic: Shrublands; Acacia ramulosa scrub/succulent steppe; Samphire) were the most widespread. Eight associations are considered restricted in the region, of which association 561: Succulent steppe with low woodland; Mulga over saltbush is the most regionally restricted of those mapped at the study area with 8,966 ha mapped within the Murchison IBRA bioregion (Table 2.2).

Table 2.2 – Beard vegetation mapped in the study area

<table>
<thead>
<tr>
<th>Vegetation code (Shepherd et al. 2001)</th>
<th>Vegetation association (Beard 1976)</th>
<th>Area mapped in the study area (ha)</th>
<th>Area mapped in the Murchison (ha)</th>
<th>% total area mapped in the Murchison &amp; (% regional distribution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Medium woodland; coolabah (Eucalyptus microtheca)</td>
<td>2.3</td>
<td>9,195</td>
<td>&lt;0.1% (Restricted)</td>
</tr>
<tr>
<td>18</td>
<td>Low woodland; Mulga (Acacia aneura)</td>
<td>144.9</td>
<td>12,435,564</td>
<td>44.1% (Widespread)</td>
</tr>
<tr>
<td>29</td>
<td>Sparse low woodland; Mulga, discontinuous in scattered groups</td>
<td>94.0</td>
<td>2,974,137</td>
<td>10.5% (Widespread)</td>
</tr>
<tr>
<td>39</td>
<td>Shrublands; Mulga scrub</td>
<td>9.1</td>
<td>1,152,458</td>
<td>4.1% (Moderate)</td>
</tr>
<tr>
<td>40</td>
<td>Shrublands; Acacia scrub, various species</td>
<td>6.0</td>
<td>59,230</td>
<td>0.2% (Restricted)</td>
</tr>
<tr>
<td>107</td>
<td>Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmillii over hard spinifex</td>
<td>105.9</td>
<td>2,794,374</td>
<td>9.9% (Widespread)</td>
</tr>
<tr>
<td>125</td>
<td>Bare areas; salt lakes</td>
<td>1,399.7</td>
<td>712,038</td>
<td>2.5% (Moderate)</td>
</tr>
<tr>
<td>182</td>
<td>Low woodland; Mulga &amp; Acacia ramulosa</td>
<td>3.6</td>
<td>51,015</td>
<td>0.2% (Moderate)</td>
</tr>
<tr>
<td>188</td>
<td>Shrublands; mulga and Acacia sclerosperma scrub</td>
<td>21.6</td>
<td>11,990</td>
<td>&lt;0.1% (Restricted)</td>
</tr>
<tr>
<td>204</td>
<td>Succulent steppe with open scrub; scattered Mulga &amp; Acacia sclerosperma over saltbush &amp; bluebush</td>
<td>439.9</td>
<td>186,550</td>
<td>0.7% (Restricted)</td>
</tr>
<tr>
<td>560</td>
<td>Mosaic: Shrublands; Acacia ramulosa scrub / succulent steppe; Samphire</td>
<td>693.6</td>
<td>84,797</td>
<td>0.3% (Restricted)</td>
</tr>
<tr>
<td>561</td>
<td>Succulent steppe with low woodland; mulga over saltbush</td>
<td>38.5</td>
<td>8,966</td>
<td>&lt;0.1% (Restricted)</td>
</tr>
<tr>
<td>676</td>
<td>Succulent steppe; Samphire</td>
<td>152.6</td>
<td>383,163</td>
<td>1.4% (Restricted)</td>
</tr>
</tbody>
</table>

Note: Widespread = a large proportion (>9%) of the Murchison is mapped as these units, Moderate = a moderate proportion (1.5-9%) of the Murchison is mapped as these units, Restricted = very small proportion (<1.5%) of the Murchison are mapped as these units.
Beard vegetation mapped in the study area

Legend
- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Figure: 2.1
Project ID: 1625
Drawn: MH
Date: 09/04/2016

Absolute Scale - 1:440,000
2.2 THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

No Commonwealth or State listed TECs were recorded as occurring within 50 km of the study area (Table 2.3, Figure 2.2).

Five PECs were recorded within the study area, however they are underground invertebrate assemblages and are not pertinent to the flora and vegetation. The closest PECs that are relevant to the flora and vegetation are the Wiluna West vegetation complexes (Banded Ironstone Formation), approximately 20 km west and the Violet Range vegetation complexes (Banded Ironstone Formation), approximately 40 km south of the study area.

Table 2.3 – PECs within 50 km of the study area

<table>
<thead>
<tr>
<th>Community</th>
<th>Category</th>
<th>Within study area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albion Downs calcrete groundwater assemblage type on Carey palaedrainage on Albion Downs Station</td>
<td>Priority 1</td>
<td>No</td>
</tr>
<tr>
<td>Barwidgee calcrete groundwater assemblage type on Carey palaedrainage on Barwidgee Station</td>
<td>Priority 1</td>
<td>Yes</td>
</tr>
<tr>
<td>Hinkler Well calcrete groundwater assemblage type on Carey palaedrainage on Lake Way Station</td>
<td>Priority 1</td>
<td>Yes</td>
</tr>
<tr>
<td>Lake Violet south and Lake Violet calcrete groundwater assemblage types on Carey palaedrainage on Millbillillie Station</td>
<td>Priority 1</td>
<td>Yes</td>
</tr>
<tr>
<td>Lake Way South calcrete groundwater assemblage type on Carey palaedrainage on Lake Way Station</td>
<td>Priority 1</td>
<td>No</td>
</tr>
<tr>
<td>Millbillillie Bubble Well calcrete assemblage type on Carey palaedrainage on Millbillillie Station</td>
<td>Priority 1</td>
<td>No</td>
</tr>
<tr>
<td>Uramurdah Lake calcrete groundwater assemblage type on Carey palaedrainage on Millbillillie Station</td>
<td>Priority 1</td>
<td>No</td>
</tr>
<tr>
<td>Yeelirrie calcrete groundwater assemblage type on Carey palaedrainage on Yeelirrie Station</td>
<td>Priority 1</td>
<td>No</td>
</tr>
</tbody>
</table>
PECs recorded within 50 km of the study area
3 METHODS

3.1 GUIDING PRINCIPLES

This flora and vegetation consolidation assessment was undertaken to supplement previous surveys that are undergoing an Environmental Impact Assessment process in WA and is required to address the following government legislation:

- EPAs Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002); and

Specifically, this report will provide:

- A review of background information used for the flora and vegetation conservation assessment (including literature and database searches);
- Maps and details of any significant flora identified in the literature review;
- An inventory of vegetation types occurring at the study area, incorporating recent published and unpublished records; and
- A map and detailed description of vegetation types (to NVIS Level V: Association) occurring in the study area and an assessment of which vegetation units represent Threatened or Priority Ecological Communities.

3.2 DATABASE SEARCHES

Using the shapefile of the haul road of the Extension to the Wiluna Uranium Project area a search of the DPaW Threatened and Priority Ecological Communities Database (Search reference 25-0514EC) with a 50 km buffer was undertaken in September 2014, to locate TECs and PECs previously recorded in the vicinity of the study area.

Nationally Listed Threatened Ecological Communities

Ecological communities are naturally occurring biological assemblages associated with a particular type of habitat (DEC 2010). At a national level, flora and Threatened Ecological Communities (TECs) are protected under the Commonwealth EPBC Act.

A search of the EPBC protected matters search tool was undertaken to locate matters of national environmental significance.

State Listed Threatened Ecological Communities

DPaW also maintains a list of state listed TECs which are further categorised into three subcategories, much like those of the EPBC Act. Within the Western Australian classification, an ecological community will be listed as Vulnerable “when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future”.

A search of the DPaW state listed TEC Database for the study area was conducted.

State Listed Priority Ecological Communities

DPaW maintains a list of Priority Ecological Communities (PEC). PECs include potential TECs that do not meet survey criteria, or that are not adequately defined.

A search of the DPaW Priority Ecological Communities Database for the study area was conducted.
3.3 CONSOLIDATION OF DATA

A number of finer scale surveys have been conducted for the Wiluna Uranium Project and the Extension to the Wiluna Uranium Project (see Section 2.1). Data from the flora and vegetation surveys listed below was used to conduct the flora and vegetation consolidation:

- Niche (2011): Assessment of the flora and vegetation of: Lake Way, Centipede and West Creek Borefield;
- Niche (2014): Assessment of the flora and vegetation of: Millipede;
- *ecologia* (2015c): Millipede to Lake Maitland Haul Road Level 2 flora and vegetation assessment; and

There have been 10 separate phases of assessments conducted at or in the vicinity of the study area which were included in the statistical analysis for the vegetation consolidation (Table 3.1). Five-hundred and six quadrats (all 30 x 30 m) were surveyed at and in the vicinity of the study area during these assessments and these are mapped in Figure 3.1.

**Table 3.1 – Surveys used for the vegetation consolidation**

<table>
<thead>
<tr>
<th>Report</th>
<th>Survey Phases</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Lake Maitland: baseline vegetation and flora surveys | 1: May 2007  
| Assessment of the flora and vegetation of: Lake Way, Centipede and West Creek Borefield | 1: April-June 2010  
| Millipede to Lake Maitland Haul Road Level 2 Flora and vegetation assessment | 1: June 2014  
2: October 2014  
3: January 2015  
4: March 2015 | *ecologia* (2015c) |
Flora and Vegetation Assessments
- Lake Way (Outback Ecology 2007)
- Lake Maitland (Outback Ecology 2009)
- Lake Way, Centipede and West Creek Borefield (Niche 2011)
- Millipede to Lake Maitland (ecologia 2015)

Legend
- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Quadrats used for the vegetation consolidation

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994
3.4 VEGETATION UNIT DELINEATION AND MAPPING

Vegetation units are delineated based on shared characteristics such as the vegetation structure, dominant species and species composition. A combination of aerial photography, clustering patterns observed from hierarchical cluster analysis and ground truthing was used to interpret the vegetation patterns and allow for the vegetation mapping.

Vegetation units are described based on the National Vegetation Information System (NVIS) methodology (ESCAVI 2003) and are described to association level (level V) where the dominant growth form, height and crown cover for three species are described for three strata (upper, middle and ground).

Vegetation mapping was conducted for a 50,780.8 ha area which included the study area and areas surrounding it.

3.4.1 Statistical Analysis

Statistical analysis provides an objective means of defining vegetation units and provides insight into the hierarchical relationship between communities based on the degree of similarity in species composition and abundance.

Multivariate analysis was conducted using the site by species matrix from the quadrats completed during all the surveys listed in Table 3.1. The site by species matrix was treated in the following manner:

- Data was transformed to presence/absence, rather than cover weighted to reduce observer bias;
- Taxa were removed from the data or in some cases grouped together if they could not be confidently identified to species level and there was a possibility of confusion with other similar taxa;
- All *Tecticornia* species were consolidated into one ‘*Tecticornia* sp.’ entity as they were either not provided in the data or identifications were inconsistent between projects;
- Annual taxa were removed; and
- Subspecies and varieties of the same species were combined.

An association matrix was calculated from the site by species data using the Bray-Curtis coefficient in PATN v3.11. This was then used to perform a hierarchical cluster analysis using the Unweighted Pair Group Method with Arithmetic mean. The clustering patterns from the resultant dendrogram were used to delineate vegetation units which were then described on the basis of the most prevalent species within the unit as a whole. The site by species matrix used for the analysis is provided electronically in Appendix A and the dendrogram in Appendix B.

A combination of aerial photography, clustering patterns observed from the dendrogram, and ground truthing was used to interpret the vegetation patterns, which was subsequently used to inform vegetation mapping.

3.4.2 *Tecticornia* Vegetation Community Mapping

During the statistical analysis all *Tecticornia* species were combined due to the lack of taxonomic clarification of the genera and high variation of terminology between projects. This resulted in four very broad *Tecticornia* communities being delineated (S, T, U and V) which were combined for this assessment into one *Tecticornia* dominated vegetation unit – TECT.

Further refinement of the *Tecticornia* dominated vegetation at the study area was conducted by *ecologia* (2015a).
3.5 VEGETATION CONSERVATION SIGNIFICANCE ASSESSMENT

Vegetation communities were assessed for National, State, regional and local significance.

National significance refers to those features of the environment which are recognised under legislation as being of importance to the Australian community; in particular TECs listed under the EPBC Act are regarded as nationally significant.

State significance refers to those features of the environment that are recognised under State legislation as being of importance to the Western Australian community, in particular communities listed as TECs or PECs under the WC Act are of state significance.

Regional significance addresses the representation of species and habitats at a biogeographic regional level. Vegetation communities that are restricted to the Murchison bioregion and whose distributions are limited or unknown are considered regionally significant. Regional significance of vegetation was assessed using Beard vegetation mapping at the study area and in the Murchison to determine potential regional distribution. As the Beard mapping was conducted at a large scale it does not always accurately represent the mapped communities at the study area, especially the minor details including drainage channels, creeklines and hill slopes. If a vegetation unit mapped at the project area can be attributed to a Beard vegetation unit, it can be used to loosely determine the potential extent of this community in the region.

Local significance is when a species or vegetation unit is confined to a specialised habitat type that is not locally common and potentially restricted to the local area and whose disturbance or removal may lead to local extinction. A local vegetation conservation assessment will be conducted based on regional distribution, presence of significant flora, vegetation condition, average species richness as well as whether or not it is part of a known significant community (i.e. TEC, PEC etc.).

3.6 STUDY TEAM

This vegetation consolidation conducted by ecolologia was planned, coordinated, executed and reported by those summarised below in Table 3.2.

Table 3.2 – Study team

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification</th>
<th>Role</th>
<th>Project role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew Macdonald</td>
<td>PhD (Botany)</td>
<td>Principal Ecologist</td>
<td>Reporting, project management</td>
</tr>
<tr>
<td>Melissa Hay</td>
<td>B.Sc. (Hons)</td>
<td>Senior Botanist</td>
<td>Reporting</td>
</tr>
</tbody>
</table>
This page has been left blank intentionally.
### CONSOLIDATED RESULTS

#### 4.1 FLORA

##### 4.1.1 Priority flora

Twelve Priority flora taxa were identified from the flora and vegetation assessments included in this consolidation. They are listed in Table 4.1, mapped on Figure 4.1 and coordinates are provided electronically in Appendix A.

**Table 4.1 – Priority flora recorded during the consolidation**

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Reference</th>
<th>Location and population description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eremophila congesta</em></td>
<td>Niche (2011)</td>
<td>Recorded extensively throughout the West Creek Borefield and one location west of the Millipede Deposit.</td>
</tr>
<tr>
<td><em>Tecticornia</em> sp. Sunshine Lake (K.A. Shepherd et al. KS 867)</td>
<td>ecologia (2015c)</td>
<td>Recorded commonly at both Lake Maitland and Lake Way.</td>
</tr>
<tr>
<td><strong>Priority 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cratystylis centralis</em></td>
<td>ecologia (2015c)</td>
<td>Two locations to the west of the Lake Maitland Deposit.</td>
</tr>
<tr>
<td><em>Eremophila arachnoides</em> subsp. <em>arachnoides</em></td>
<td>Niche (2011) Niche (2014)</td>
<td>Three large populations were described. One population at Centipede Deposit (5,440 individuals) one population north of Lake Way Deposit (9,211 individuals) and one population approximately 100 km north of Wiluna (18,000 individuals).</td>
</tr>
<tr>
<td><em>Homalocalyx echinulatus</em></td>
<td>Niche (2011)</td>
<td>Recorded from the West Creek Borefield. No abundance details or locations available.</td>
</tr>
<tr>
<td><em>Maireana prosthecochaeta</em></td>
<td>Outback Ecology (2007)</td>
<td>One record in the south-east of Lake Maitland. A targeted search by ecologia (November 2014 and January 2015) of approximately 23 km in and around the location of the original record, and areas of similar habitat (ecologia 2015b) suggests that this was an identification error and unlikely to occur here.</td>
</tr>
<tr>
<td><em>Mirbelia stipitata</em></td>
<td>Niche (2011)</td>
<td>Collected from adjacent to Gunbarrel Highway during the regional survey. Not recorded in the study area.</td>
</tr>
<tr>
<td><em>Stackhousia clementii</em></td>
<td>Niche (2011) Niche (2014) ecologia (2015c)</td>
<td>Two populations were reported, one at the West Creek Borefield (114 individuals) and one west of the Centipede Deposit/Millipede Deposit (500-1,000 individuals). One population of between 500 and 1,000 individuals in a minor tributary in the south of the Millipede Deposit.</td>
</tr>
<tr>
<td><em>Tecticornia cymbiformis</em></td>
<td>Actis (2012) ecologia (2015c) ecologia (2015a)</td>
<td>Recorded at one quadrat at Lake Maitland. No coordinates available, so has not been included. Significant population (5,480 individuals) at Lake Maitland, including fringing the main lake bed and a small salt pan to the west of Lake Maitland (intercepting the Haul Road alignment).</td>
</tr>
<tr>
<td><strong>Priority 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eremophila pungens</em></td>
<td>ecologia (2015c)</td>
<td>A significant population of over 2,000 individuals was recorded from the Millipede to Lake Maitland haul road.</td>
</tr>
<tr>
<td><em>Frankenia confusa</em></td>
<td>ecologia (2015c)</td>
<td>Scattered individuals on edge of Lake Way and Lake Maitland.</td>
</tr>
</tbody>
</table>

^ = no coordinates available
### 4.1.2 New, potentially new and atypical flora taxa

The new, potentially new and atypical taxa identified from the flora and vegetation assessments included in this consolidation are listed in Table 4.2. The new and potentially new taxa are mapped on Figure 4.2 and Figure 4.3 respectively, and coordinates are provided electronically in Appendix A.

**Table 4.2 – New, potentially new and atypical flora taxa recorded during the consolidation**

<table>
<thead>
<tr>
<th>Taxa</th>
<th>Location and population description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New taxa (ecologia 2015a)</strong></td>
<td></td>
</tr>
<tr>
<td>Tecticornia aff. halocnemoides s.l. 'large ovate seed aggregate'</td>
<td>Lake Way: Common on the edge of the main salt lake and minor tributary to the south of Millipede/Centipede. Lake Maitland: Common on the main lake bed and trail of small salt pans that run to the south.</td>
</tr>
<tr>
<td>Tecticornia aff. halocnemoides s.l. 'tuberculate seed'</td>
<td>Lake Maitland: Common on the main lake bed and trail of small salt pans that run to the south.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. Burnerinmah (inflated fruit)</td>
<td>Lake Way: Recorded scattered along the minor tributary in the south of Millipede.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. globulifera (small)</td>
<td>Lake Way: Very common on the edge of the main lake bed and minor tributaries. Lake Maitland: Very common on the main lake bed and on the trail of small salt pans to the south.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. laevigata (non-rotated fruitlets)</td>
<td>Lake Maitland: Common on the main lake bed and the small salt pan trail that runs south.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. pruinosa (inflated bracts)</td>
<td>Lake Maitland: Scattered on the main lake bed.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. undulata (broad articles)</td>
<td>Lake Way: Common on the main lake bed and minor tributaries. Lake Maitland: Very common on the main lake bed and on the trail of small salt pans to the south.</td>
</tr>
<tr>
<td><strong>Potentially new taxa (ecologia 2015a &amp; Niche 2011)</strong></td>
<td></td>
</tr>
<tr>
<td>?Tecticornia sp. aff. globulifera (small)</td>
<td>Lake Way: Scattered on the main lake bed. Lake Maitland: Scattered on the trail of small salt pans that run to the south.</td>
</tr>
<tr>
<td>Tecticornia aff. halocnemoides (unusual epidermis)</td>
<td>Lake Maitland: Scattered at one location in the trail of small salt pans that run to the south.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. laevigata</td>
<td>Lake Maitland: Common on the main lake bed of the Centipede and Millipede Deposits and on the main tributary that runs north from the Lake Way Deposit.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. pruinosa</td>
<td>Lake Way: Very common on the main lake bed of the Centipede/Millipede and Lake Way Deposits. Also recorded on the minor tributaries of both areas.</td>
</tr>
<tr>
<td>Tecticornia sp. aff. undulata</td>
<td>Lake Way: Very common on the main lake bed of the Centipede/Millipede and Lake Way Deposits. Also recorded on the minor tributaries of the Lake Way Deposit.</td>
</tr>
<tr>
<td>Tecticornia sp. holocnemoides beaked seed aggregate</td>
<td>Lake Way: Common on the main lake bed and the minor tributary running north from the Lake Way Deposit.</td>
</tr>
<tr>
<td>Tecticornia sp. Nov.</td>
<td>One location in a regional quadrat. Located 8 km east of the Centipede Deposit.</td>
</tr>
<tr>
<td><strong>Atypical Taxa (ecologia 2015a &amp; Niche 2011)</strong></td>
<td></td>
</tr>
<tr>
<td>Frankenia ?interioris^</td>
<td>Recorded in the Centipede and Lake Way study area.</td>
</tr>
<tr>
<td>Frankenia sp. aff. fecunda (glabrous lead variant)</td>
<td>Recorded south of the Millipede/Centipede Deposits.</td>
</tr>
<tr>
<td>Frankenia sp. cf. glomerata^</td>
<td>Recorded at the West Creek Borefield area.</td>
</tr>
<tr>
<td>Rhagodia drummondii^</td>
<td>Scattered in the Lake Way Deposit and regionally near Lake King.</td>
</tr>
<tr>
<td>Scaevola spinescens^</td>
<td>Common across the Centipede and Lake Way Deposits and the West Creek Borefield.</td>
</tr>
<tr>
<td>Surreya ?diandra</td>
<td>One location in the south-western section of the Millipede Deposit.</td>
</tr>
</tbody>
</table>

*^ = no coordinates available
New taxa recorded during the consolidation

Legend

Wiluna Uranium Project Study Area
Extension to the Wiluna Uranium Project Study Area

New Taxa

- Tecticornia aff. halocnemoides s.l. 'large ovate seed aggregate'
- Tecticornia aff. halocnemoides s.l. 'tuberculate seed'
- Tecticornia sp. aff. globulifera (small)
- Tecticornia sp. aff. laevigata (non-rotated fruitlets)
- Tecticornia sp. aff. pruinosa (inflated bracts)
- Tecticornia sp. aff. undulata (broad articles)
- Tecticornia sp. aff. Burnerbinmah (inflated fruit)
Legend

Wiluna Uranium Project Study Area
Extension to the Wiluna Uranium Project Study Area

Potentially New Taxa

?-Tecticornia sp. aff. globulifera (small)
- Tecticornia aff. halocnemoides (unusual epidermis)
- Tecticornia sp. halocnemoides beaked seed aggregate
- Tecticornia sp. Nov.
- Tecticornia sp. aff. laevigata
- Tecticornia sp. aff. pruinosa
- Tecticornia sp. aff. undulata

Potentially new taxa recorded during the consolidation
4.1.3 Range extensions

The range extensions identified from the flora and vegetation assessments included in this consolidation are listed in Table 4.3 and locations are mapped on Figure 4.4. Coordinates are provided electronically in Appendix A.

Table 4.3 – Range extensions recorded during the consolidation

<table>
<thead>
<tr>
<th>Flora taxon (reference)</th>
<th>Comment</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acacia aneura</em> var. <em>cf major</em> (Outback Ecology 2009)</td>
<td>This taxon was recorded from two locations north of Lake Maitland. Without a reference specimen, the identity of this species is difficult to establish given the recent taxonomic changes within the <em>Acacia aneura</em> complex.</td>
<td>Not recorded from WA</td>
</tr>
<tr>
<td><em>Acacia brumalis</em> (Outback Ecology 2009)</td>
<td>Without a reference specimen, the identity of these specimens is difficult to establish. Recorded at the southern end of the Lake Maitland Deposit.</td>
<td></td>
</tr>
<tr>
<td><em>Acacia heteroneura</em> var. <em>jutsonii</em> (ecologia 2015c)</td>
<td>Recorded from one location on a sandplain on the haul road. Nearest record approximately 150 km west of the study area.</td>
<td></td>
</tr>
<tr>
<td><em>Acacia maxwellii</em> (Outback Ecology 2009)</td>
<td>Without a reference specimen, the identity of this species is difficult to establish. Recorded at the southern end of the Lake Maitland Deposit.</td>
<td></td>
</tr>
<tr>
<td><em>Acacia scleroclada</em> (Outback Ecology 2009)</td>
<td>Without a reference specimen, the identity of this species is difficult to establish. Recorded to the south-east of the Lake Maitland Deposit.</td>
<td></td>
</tr>
<tr>
<td><em>Brachyscome iberidifolia</em>^ (Niche 2011)</td>
<td>This record is not considered to represent the limit of the range of this species, given that there are collections from further into the arid zone than the project location.</td>
<td></td>
</tr>
</tbody>
</table>
### Flora taxon (reference) | Comment | Distribution
--- | --- | ---

*Centaurea melitensis*  
(Niche 2011)  

Recognition of a range extension for an introduced species may have management implications, but is not relevant to impact assessments. Recorded from the West Creek Borefield, but specific location information is not available for this record.

Cratystylis subspinescens  
(Niche 2011)  

No information available.

Cynanchum floribundum  
(Niche 2011)  

Recorded scattered in two locations at the West Creek Borefield.

Dicrastylis doranii  
(Niche 2011)  

No information available.

Disphyma crassifolium subsp. clavellatum  
(Niche 2011)  

No information available.

Dysphania plantaginella  
(Niche 2011)  

Two locations recorded just outside the haul road near Lake Maitland.

Dysphania truncata  
(Niche 2011)  

Possible misidentification. Without a reference specimen, the identity of this species is difficult to establish.  

Not recorded from WA
<table>
<thead>
<tr>
<th>Flora taxon (reference)</th>
<th>Comment</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Euphorbia biconvexa</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td><em>Frankenia interioris</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td><em>Gnephosis angianthoides</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td>?<em>Gompholobium simplicifolium</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td><em>Gnniopsis rodwayi</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td><em>Gnniopsis septifraga</em>^</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Niche 2011)</td>
<td>No information available.</td>
<td><img src="image" alt="Map" /></td>
</tr>
<tr>
<td>Flora taxon (reference)</td>
<td>Comment</td>
<td>Distribution</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Isoetopsis graminifolia^ (Niche 2011)</td>
<td>No information available.</td>
<td><img src="image1.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Maireana amoena^ (Niche 2011)</td>
<td>No information available.</td>
<td><img src="image2.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Maireana appressa^ (Niche 2011)</td>
<td>No information available.</td>
<td><img src="image3.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Maireana lobiflora (ecologia 2015c)</td>
<td>Scattered individuals to the south-east of Lake Maitland.</td>
<td><img src="image4.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Maireana luehmannii (ecologia 2015c)</td>
<td>Recorded towards the southern end of the Millipede Deposit and just outside the haul road near Lake Maitland.</td>
<td><img src="image5.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Mollugo cerviana (ecologia 2015c)</td>
<td>One large population (approximately 1,000 plants on a floodplain between salt pans, west of lake Maitland. Nearest previous record is approximately 300 km west of Lake Maitland.</td>
<td><img src="image6.jpg" alt="Map" /></td>
</tr>
<tr>
<td>Flora taxon (reference)</td>
<td>Comment</td>
<td>Distribution</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>--------------</td>
</tr>
</tbody>
</table>
| *Murchisonia volubilis*<sup>^</sup>  
(Niche 2011) | No information available. |  |
| *Nicotiana rotundifolia*<sup>^</sup>  
(Niche 2011) | No information available. |  |
| *Paspalidium gracile*  
(ecologia 2015c) | Widespread across the study area, but uncommonly recorded from drainage lines, floodplains and salt pans. Nearest previous record is approximately 150 km south-west of study area. |  |
| *Polygala isingii*<sup>^</sup>  
(Niche 2011) | No information available. |  |
| *Pterocaulon sphecelatum*  
(ecologia 2015c) | Uncommon along a minor draining line on the haul road, south of the Millipede Deposit. Nearest previous record is approximately 150 north-east of study area. |  |
| *Ptilotus murrayi*<sup>^</sup>  
(Niche 2011) | No information available. |  |
<table>
<thead>
<tr>
<th>Flora taxon (reference)</th>
<th>Comment</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Scaevola tomentosa</em> (Niche 2011)</td>
<td>Common within the Millipede and Centipede Deposits.</td>
<td><img src="image1" alt="Map" /></td>
</tr>
<tr>
<td><em>Sclerolaena cieandii</em> (ecologia 2015a)</td>
<td>Scattered at one location in the south of the Lake Maitland Deposit.</td>
<td><img src="image2" alt="Map" /></td>
</tr>
<tr>
<td><em>Senna manicula</em> (Niche 2011)</td>
<td>Scattered in the south-eastern section of the Lake Maitland Deposit.</td>
<td><img src="image3" alt="Map" /></td>
</tr>
<tr>
<td><em>Sida kingii</em> (Outback Ecology 2009)</td>
<td>One location to the east of the Lake Maitland Deposit.</td>
<td><img src="image4" alt="Map" /></td>
</tr>
<tr>
<td><em>Sporobolus caroli</em> (ecologia 2015c)</td>
<td>One location in the southern end of the Millipede Deposit.</td>
<td><img src="image5" alt="Map" /></td>
</tr>
<tr>
<td><em>Tecticornia halocnemoides subsp. catenulata</em> (Niche 2011)</td>
<td>Recorded at 11 locations at the Centipede and Lake Way Deposits.</td>
<td><img src="image6" alt="Map" /></td>
</tr>
<tr>
<td>Flora taxon (reference)</td>
<td>Comment</td>
<td>Distribution</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
</tbody>
</table>
| *Tecticornia moniliformis*  
(Niche 2011) | Recorded commonly at the Centipede and Lake Way Deposits on the main lake bed and minor tributaries. | |
| *Tecticornia pterygosperma*  
subsp. *pterygosperma*  
(ecologia 2015 a, c) | Recorded at one location at Lake Maitland, on a small salt pan to the south of the main lake bed. | |
| *Tecticornia tenuis*  
(ecologia 2015 a, c) | Recorded at three locations from Lake Way on the floodplain to the south of Millipede. | |
| *Thyridolepis xerophila*  
(ecologia 2015c) | Scattered along draining lines at the northern end of the haul road. Nearest previous record is approximately 200 km north-east of the study area. | |
| *Trachymene ceratocarpa*  
(Niche 2011) | One location within the Centipede Deposit. | |
| *Triodia plurinervata*  
(ecologia 2015c) | Recorded at one location to the east of Lake Maitland and north of the haul road. | |

Legend
- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Range extensions
- Acacia aneura var. cf major
- Acacia brumalis
- Acacia heteroneura var. jutsonii
- Acacia maxwellii
- Acacia scleroclada
- Cynanchum floribundum
- Dysphania plantaginella
- Maireana lobiflora
- Maireana lieuhmannii
- Mollugo cerviana
- Paspalidium gracile
- Pterocaunon sphacelatum
- Scaevola tomentosa
- Sclerolaena clelandii
- Senna manicula
- Sida ringi
- Tecticornia halocnemoides subsp. catenulata
- Tecticornia maniliformis
- Tecticornia pterygosperma subsp. pterygosperma
- Tecticornia tenuis
- Thyridolepis xerophila
- Trachymene ceratocarpa
- Triodia plurinervata

Range extensions recorded during the consolidation

Figure: 4.4
Project ID: 1625
Drawn: MH
Date: 29/03/2015
4.1.4  Introduced flora

The introduced flora taxa identified from the flora and vegetation assessments included in this consolidation are listed in Table 4.4 and locations shown in Figure 4.5. Coordinates are provided electronically in Appendix A.

Table 4.4 – Introduced flora taxa recorded during the consolidation

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Reference</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Acetosa vesicaria</td>
<td>Niche (2011)</td>
<td>Recorded at the Centipede and Millipede Deposits and the West Creek borefield. Four locations totalling approximately 90 individuals.</td>
</tr>
<tr>
<td>*Bidens bipinnata</td>
<td>ecologia (2015c)</td>
<td>Recorded along the haul road in large numbers along drainage lines. Four records representing an estimated 1,301 individuals.</td>
</tr>
<tr>
<td>*Brassica tournefortii^</td>
<td>Niche (2011)</td>
<td>No information available.</td>
</tr>
<tr>
<td>*Carpobrotus sp.</td>
<td>Outback Ecology (2007)</td>
<td>Recorded from three locations, two at Centipede Deposit and one at Lake Way Deposit.</td>
</tr>
<tr>
<td>*Centaurea melitensis^</td>
<td>Niche (2011)</td>
<td>Recorded from one location in the West Creek Borefield. No specific location data is available.</td>
</tr>
<tr>
<td>*Citrullus ?lanatus</td>
<td>ecologia (2015c)</td>
<td>Scattered at one location in a drainage line along the haul road.</td>
</tr>
<tr>
<td>*Sonchus oleraceus</td>
<td>Niche (2011)</td>
<td>Recorded from one location at the Centipede Deposit.</td>
</tr>
<tr>
<td>*Tribulus terrestris</td>
<td>Outback Ecology (2009)</td>
<td>Recorded along the eastern edge of the lake Maitland Deposit and along the haul road to the west of Lake Maitland.</td>
</tr>
</tbody>
</table>

^ = no coordinates available.
Legend
- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Introduced flora
- *Acetosa vesicaria
- *Bidens bipinnata
- *Carpobrotus sp.
- *Citrullus lanatus
- *Lysimachia arvensis
- *Sonchus oleraceus
- *Tribulus terrestris

Figure: 4.5
Project ID: 1625
Drawn: MH
Date: 29/03/2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Introduced flora recorded during the consolidation
4.2 VEGETATION

A total of 28 vegetation units (including a single, combined *Tecticornia*-dominated unit) have been consolidated and mapped at and in the vicinity of the study area. These vegetation units as well as the bare salt lake bed (with no vegetation cover) were mapped across a total area of 50,780.8 ha.

These are described in Table 4.5, an overview map is shown in Figure 4.6 and more detailed vegetation mapping is presented in Figure 4.7 to Figure 4.16. The dendrogram showing the delineated vegetation communities used in this report is presented in Appendix B.
Table 4.5 – Vegetation units mapped at and in the vicinity of the study area

<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Acacia tetragonophylla sparse tall shrubland, over Senna artemisioides and Ptilotus obovatus sparse low shrubland.</td>
<td>Extent: 3,070.2 ha Average species richness: 8.8 ± 3.4 Landform: Plain Number of quadrats: 24</td>
<td>Acacia aneura/aptaneura Acacia burkittii Acacia pteraneura/macraneeura Eremophila longifolia Hakea francisiana Rhagodia eremaea Scaevola spinescens</td>
<td><img src="image1" alt="Photograph" /></td>
</tr>
<tr>
<td>AB</td>
<td>Acacia tetragonophylla, Acacia victoriae and Ptilotus obovatus sparse low shrubland.</td>
<td>Extent: 1,512.1 ha Average species richness: 5.8 ± 1.9 Landform: Plain Number of quadrats: 5</td>
<td>Acacia aneura/aptaneura Acacia burkittii Eremophila arachnoides subsp. arachnoides Grevillea nematophylla Senna artemisioides</td>
<td><img src="image2" alt="Photograph" /></td>
</tr>
<tr>
<td>AC</td>
<td>Eucalyptus camaldulensis subsp. obtusa sparse low woodland, over Acacia aptaneura and Acacia tetragonophylla sparse tall shrubland, over Eremophila longifolia, Senna artemisioides and Scaevola spinescens sparse mid shrubland.</td>
<td>Extent: 3,009.2 ha Average species richness: 10.5 ± 3.5 Landform: Plain Number of quadrats: 15</td>
<td>Acacia aneura/aptaneura Acacia victoriae Eragrostis eriopoda Grevillea nematophylla Hakea francisiana/minyma Ptilotus obovatus Rhagodia eremaea Santalum lanceolatum</td>
<td><img src="image3" alt="Photograph" /></td>
</tr>
<tr>
<td>Code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Associated species</td>
<td>Photograph</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------</td>
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<td>------------</td>
</tr>
</tbody>
</table>
| BA   | *Acacia aneura/aptaneura* sparse low woodland, over *Acacia tetragonophylla* (+/- *Melaleuca hamata*) sparse tall shrubland, over *Senna artemisioides*, *Scaevola spinescens* and *Rhagodia drummondii* sparse mid shrubland, over *Ptilotus obovatus*, *Maireana villosa*, *Sclerolaena diacantha* and *Cratystylis subspinescens* sparse low shrubland. | Extent: 92.3 ha  
Average species richness: 14.5 ± 3.1  
Landform: Plain  
Number of quadrats: 13 | *Acacia pteraneura/macranuera*  
*Atriplex amnicola*  
*Enchyelaen tomentosa var. tomentosa*  
*Enteropogon ramosus*  
*Eremophila galeata*  
*Exocarpos aphyllus*  
*Maireana triptera*  
*Melaleuca xerophila*  
*Pittosporum phylliraeoides*  
*Sclerolaena densiflora*  
*Solanum lasiophyllum*  
*Solanum nummularium* | ![Photograph](image1) |
| BB   | *Casuarina pauper* open low woodland, over *Eremophila pantoni*, *Eremophila longifolia* and *Eremophila latrobei* sparse mid shrubland, over *Scaevola spinescens*, *Exocarpos aphyllus*, *Rhagodia drummondii* and *Ptilotus obovatus* sparse low shrubland. | Extent: 1,376.4 ha  
Average species richness: 15.7 ± 2.3  
Landform: Plain  
Number of quadrats: 7 | *Acacia nyssophylla*  
*Eremophea spinosa*  
*Eremophila forrestii*  
*Eriochiton sclerolaenoides*  
*Hakea preissii*  
*Sclerolaena diacantha*  
*Sclerolaena obliquicuspis*  
*Senna artemisioides*  
*Sida sp. dark green fruits (S. van Leeuwen 2260)*  
*Solanum lasiophyllum* | ![Photograph](image2) |
| BC   | *Scaevola spinescens*, *Eremophila malacoides*, *Rhagodia drummondii*, *Maireana villosa* and *Eremophila glabra* sparse low shrubland, over *Enteropogon ramosus* sparse tussock grassland. | Extent: 70.2 ha  
Average species richness: 11.3 ± 2.3  
Landform: Plain  
Number of quadrats: 3 | *Enchyelaen tomentosa var. tomentosa*  
*Eremophila forrestii*  
*Eremophila glandulifera*  
*Eremophila longifolia*  
*Exocarpos aphyllus*  
*Grevillea extorris*  
*Sclerolaena diacantha*  
*Triodia basedowii* | ![Photograph](image3) |
<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
</table>
| BD   | **Acacia aneura/aptaneura** sparse low woodland, over **Maireana pyramidata**, **Maireana triptera** and **Atriplex bunburyana** open low shrubland. | Extent: 180.3 ha Average species richness: 10.7 ± 3.8 Landform: Plain Number of quadrats: 6                                                                                   | *Enchyela tomentosa* var. *tomentosa*  
*Enteropogon ramosus*  
*Eremophila forrestii*  
*Eremophila longifolia*  
*Maireana georgei*  
*Rhagodia drummondii*  
*Sclerolaena cuneata*  
*Sida fibulifera*  
*Solanum lasiophyllum*                                                                                                         | ![BD Photograph](image) |
| CA   | **Acacia aneura/aptaneura** sparse low woodland, over *Acacia burkittii* open tall shrubland, over *Eremophila galeata*,  
*Eremophila compacta*, *Senna* sp. Meekatharra (E. Bailey 1-26), *Senna artemisioides* and *Sida ectogama*  
sparse mid shrubland, over *Monachather paradoxus* open tussock grassland.                                                      | Extent: 34.6 ha Average species richness: 16 ± 4.5 Landform: Undulating plain and rocky hillslope Number of quadrats: 6  | *Solanum lasiophyllum*  
*Acacia tetragonophylla*  
*Indigofera monophylla*  
*Scaevola spinescens*  
*Eragrostis eriopoda*  
*Eremophila oldfieldii*  
*Ptilotus obovatus*  
*Maireana thesioides*  
*Hibiscus burtonii*  
*Senna glaucifolia*  
*Eremophila pantoni*  | ![CA Photograph](image) |
| CB   | **Acacia aneura/aptaneura** open low woodland, over *Acacia burkittii* and *Acacia tetragonophylla* sparse tall shrubland, over *Senna artemisioides* x *artemisioides*, *Senna glaucifolia* and *Eremophila galeata*  
sparse mid shrubland, over *Aristida contorta* open tussock grassland.                                                                | Extent: 6.6 ha Average species richness: 27.5 ± 2.1 Landform: Drainage line Number of quadrats: 2                                                                             | *Abutilon otocarpum*  
*Acacia craspedocarpa*  
*Cheilanthes sieberi* subsp. *sieberi*  
*Cyperus betchei* subsp. *commiscens*  
*Digitaria brownii*  
*Eremophila clarkei*  
*Eremophila compacta*  
*Indigofera monophylla*  
*Paspalidium gracile*  
*Pluchea dentex*  
*Sclerolaena diacantha*  
*Themeda triandra*                                                                                                                  | ![CB Photograph](image) |
<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>Acacia pteraneura/macrannea isolated low trees, over Eremophila galeata, Senna artemisioides and Sida ectogama sparse mid shrubland, over Eragrostis eriopoda and Monachather paradoxus open tussock grassland.</td>
<td>Extent: 122.2 ha  Average species richness: 13.5 ± 4.1  Landform: Plain  Number of quadrats: 13</td>
<td>Acacia aneura/aptaneura  Acacia burkittii/quadrimagina  Acacia craspedocarpa  Acacia tetragonophylla  Eremophila latrabei  Maireana thesioides  Psydrax rigidula  Ptilotus obovatus  Solanum lasiophyllum</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>CD</td>
<td>Acacia aneura/aptaneura, Acacia pteraneura/macrannea and Acacia craspedocarpa low woodland, over Eremophila gilesii, Eremophila galeata and Senna artemisioides sparse mid shrubland, over Sida sp. verrucose glands (F.H. Mollemans 2423), Solanum lasiophyllum and Abutilon cryptopetalum sparse low shrubland, over Digitaria brownii, Eragrostis eriopoda and Monachather paradoxus sparse tussock grassland.</td>
<td>Extent: 25.4 ha  Average species richness: 19.1 ± 3.6  Landform: Plain, floodplain, drainage lines  Number of quadrats: 8</td>
<td>Acacia ayersiana/caesaneura  Acacia tetragonophylla  Duperreya commixta  Eremophila latrabei  Eremophila marginata  Maireana thesioides  Psydrax rigidula  Psydrax suaveolens  Rhyncharrhena linearis  Santalum spicatum  Sida ectogama  Spartothamnella teucriflora</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>D</td>
<td>Acacia aneura/aptaneura and Acacia ayersiana/caesaneura open low woodland (+/- Acacia tetragonophylla and Acacia pruinocarpa), over Eremophila forrestii, Eremophila latrabei and Eremophila foliosissima sparse mid shrubland, over Eragrostis eriopoda sparse tussock grassland and Triodia melvillei sparse hummock grassland.</td>
<td>Extent: 9,335.4 ha  Average species richness: 9.3 ± 2.7  Landform: Plain, floodplain, drainage lines  Number of quadrats: 41</td>
<td>Acacia craspedocarpa  Acacia rhodophloia  Cheilanthes sieberi subsp. sieberi  Eremophila congesta  Psydrax rigidula  Psydrax suaveolens  Ptilotus schwartzii  Rhagodia drummondii  Rhagodia eremae  Senna glaucifolia  Spartothamnella teucriflora</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>Code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Associated species</td>
<td>Photograph</td>
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<tr>
<td>E</td>
<td>Acacia aneura/ aptaneura/ ayersiana/ caesaneura (+/-Eucalyptus gypsophila) sparse low woodland, over Acacia nyssophylla, Eremophila arachnoides subsp. arachnoides and Acacia victoriae sparse mid to tall shrubland, over Ptilotus obovatus, Sclerolaena obliquicuspis and Rhagodia eremaea sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>Extent: 960.6 ha  Average species richness: 6.5 ± 3.4  Landform: Plain  Number of quadrats: 17</td>
<td>Acacia burkittii  Acacia ligulata  Acacia oswaldii  Casuarina pauper  Dodonea viscosa  Eremophila latrobei  Maireana pyramidata  Scaevola spinescens  Senna artemisioides  Solanum lasiophyllum</td>
<td><img src="image" alt="Photograph" /></td>
</tr>
<tr>
<td>F</td>
<td>+/-Acacia victoriae and/or Melaleuca interioris sparse tall shrubland, over Eremophila glabra, Scaevola spinescens, Rhagodia eremaea and Lycium australis sparse low shrubland.</td>
<td>Extent: 137.4 ha  Average species richness: 6 ± 2.3  Landform: Plain  Number of quadrats: 12</td>
<td>Acacia burkittii  Acacia nyssophylla  Atriplex amnicola  Eragrostis eriopoda  Eremophila arachnoides subsp. arachnoides  Maireana pyramidata  Muellerolimon salicorniaceum  Sclerolaena fimbriolata  Sclerolaena obliquicuspis</td>
<td><img src="image" alt="Photograph" /></td>
</tr>
<tr>
<td>G</td>
<td>Acacia incurvaneura low woodland (+/-Acacia craspedocarpa and Acacia ramulosa var. linophylla), over Eremophila maculata and Scaevola spinescens mid shrubland over Triodia melvillei open hummock grassland.</td>
<td>Extent: 95.0 ha  Average species richness: 6 ± 2.3  Landform: Plain  Number of quadrats: 12</td>
<td>Acacia pruinocarpa  Eremophila latrobei</td>
<td><img src="image" alt="Photograph" /></td>
</tr>
<tr>
<td>Code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Associated species</td>
<td>Photograph</td>
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</tr>
<tr>
<td>H</td>
<td>+/Eucalyptus striaticalyx and Acacia aneura/aptaneura sparse low woodland, over Eremophila glabra and Senna artemisioides sparse mid shrubland, over Dissocarpus paradoxus, Eremophila oppositifolia and Sclerolaena bicorns sparse low shrubland.</td>
<td>Extent: 6.2 ha Average species richness: 5.8 ± 1.9 Landform: Plain Number of quadrats: 4</td>
<td>Acacia victoriae Acacia xanthocarpa Amyema maidenii Atriplex bunburyana Maireana villosa Rhyncharhena linearis Santalum spicatum</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>I</td>
<td>+/-Acacia aneura/aptaneura isolated low trees, over Lycium australe, Rhagodia drummondii, Frankenia pauciflora sens. lat. and Lawrencia squamata open low shrubland.</td>
<td>Extent: 1,144.9 ha Average species richness: 5.7 ± 2.9 Landform: Plain, floodplain Number of quadrats: 4</td>
<td>Acacia ayersiana/caesaneura Atriplex amnicola Cratystylis subspinescens Eragrostis eriopoda Exocarpos aphyllus Frankenia setosa Maireana amoena Scaevola spinescens Sclerolaena cornishiana Sclerolaena parviflora Triodia basedowii</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>J</td>
<td>+/-Casuarina pauper sparse low woodland, over Atriplex bunburyana, Lycium australe, Lawrencia squamata and Ptilotus obovatus sparse low to mid shrubland, over Eragrostis setifolia sparse tussock grassland.</td>
<td>Extent: 697.6 ha Average species richness: 9.7 ± 2.5 Landform: Plain, floodplain, near salt lakes Number of quadrats: 15</td>
<td>Acacia tetragonophylla Eragrostis eriopoda Hakea preissii Rhagodia eremaea Sclerolaena cornishiana Senna artemisioides Solanum lasiophyllum</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>Code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Associated species</td>
<td>Photograph</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| K    | *Casuarina obesa* open low woodland, over *Acacia nyssophylla* sparse tall shrubland, over *Lycium australe* and *Sclerolaena fimbriolata* sparse low shrubland. | Extent: 19.7 ha  
Average species richness: 5.3 ± 0.6  
Landform: Plain  
Number of quadrats: 3 | *Eremophea spinosa*  
*Eremophila falcata*  
Ptilotus obovatus  
*Senna artemisioides*  
*Senna glutinosa* | No photograph available |
| L    | +/-*Acacia aneura/aptaneura* and *Hakea lorea* subsp. *lorea* isolated low trees, over *Alyogyne pinoniana*, *Androcalva laxophylla*, *Solanum coactiliferum* and *Leptosema chambersii* sparse low shrubland, over *Triodia basedowii* open hummock grassland and *Eragrostis eriopoda* sparse tussock grassland. | Extent: 5,827.5 ha  
Average species richness: 8 ± 3.6  
Landform: Sandy plain  
Number of quadrats: 27 | *Dicrastylis exsuccosa*  
*Dicrastylis flexuosa*  
*Eremophila forrestii*  
*Eremophila longifolia*  
*Eremophila platythamnos*  
*Eucalyptus eremicola* subsp. *peeneri*  
*Melaleuca eleuterostachya*  
*Monachather paradoxus*  
Ptilotus obovatus | |
| M    | *Acacia aneura/aptaneura* (+/-*Acacia ayersiana/caesaneura*) open low woodland, over *Eremophila forrestii*, *Eremophila spectabilis* subsp. *brevis* open mid shrubland, over *Triodia basedowii* open hummock grassland and *Eragrostis eriopoda* and *Monachather paradoxus* sparse tussock grassland. | Extent: 6,370.4 ha  
Average species richness: 12.8 ± 3.5  
Landform: Plain, sandy plain  
Number of quadrats: 37 | *Acacia minyura*  
*Acacia pruinocarpa*  
*Acacia pteraneura/macranorea*  
*Acacia tetragonophylla*  
*Eremophila gilesii*  
*Eremophila latrobei*  
*Maireana villosa*  
*Psydrax rigidula*  
*Psydrax suaveolens*  
Ptilotus obovatus  
*Sida fibulifera*  
*Sida sp. dark green fruits* |
<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
</table>
| N    | *Acacia* *ayersiana/caesaneura* open low woodland (+/--*Acacia* *aneura/aptaneura* and *Eucalyptus* *eremicola* subsp. *peeneri*) open low woodland, over +/-*Melaleuca* *interioris* sparse tall shrubland, over *Triodia* *basedowii* open hummock grassland and *Eragrostis* *eriopoda* sparse tussock grassland. | Extent: 2,088.1 ha  
Average species richness: 14.7 ± 5.2  
Landform: Plain, sandy plain  
Number of quadrats: 46 | *Acacia tetragonophylla*  
*Cratystylis* *subspinescens*  
*Enchyela* *tomentosa* var. *tomentosa*  
*Enteropogon* *ramosus*  
*Eremophila* *forrestii*  
*Grevillea* *sarissa*  
*Ptilotus* *obovatus*  
*Rhagodia* *drummondii*  
*Scaevola* *spinescens*  
*Senna* *artemisioides*  
*Solanum* *lasiophyllum* | ![Photograph](image1.png) |
| O    | *Acacia* *ayersiana/caesaneura* (+/--*Eucalyptus* *eremicola* subsp. *peeneri*) open low woodland, over *Triodia* *melvillei* open hummock grassland. | Extent: 4,807.7 ha  
Average species richness: 9 ± 3  
Landform: Plain, sandy plain  
Number of quadrats: 55 | *Acacia* *aneura/aptaneura*  
*Acacia* *ligulata*  
*Acacia* *oswaldii*  
*Eremophila* *forrestii*  
*Eremophila* *glabra*  
*Eremophila* *longifolia*  
*Grevillea* *sarissa*  
*Maireana* *pyramidata*  
*Ptilotus* *obovatus*  
*Rhagodia* *eremaea*  
*Scaevola* *spinescens*  
*Senna* *artemisioides* | ![Photograph](image2.png) |
| P    | +/--*Acacia* *ayersiana/caesaneura* sparse low woodland, over *Acacia* *ligulata* and *Acacia* *jamesiana* sparse mid shrubland, over *Halgania* *cyanea* sparse low shrubs, over *Triodia* *basedowii* open hummock grassland. | Extent: 1,234.4 ha  
Average species richness: 11.6 ± 3.4  
Landform: Plain, sandy plain  
Number of quadrats: 27 | *Calitris* *columellaris*  
*Dodonaea* *viscosa*  
*Eragrostis* *eriopoda*  
*Eremophila* *miniata*  
*Eucalyptus* *eremicola* subsp. *peeneri*  
*Grevillea* *sarissa*  
*Monachather* *paradoxus*  
*Ptilotus* *obovatus*  
*Scaevola* *spinescens*  
*Scaevola* *tomentosa*  
*Senna* *artemisioides*  
*Solanum* *lasiophyllum* | ![Photograph](image3.png) |
<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Associated species</td>
<td>Photograph</td>
<td></td>
</tr>
</tbody>
</table>
|      | *Callitris columellaris* sparse tall shrubland, over *Triodia melvillii* open hummock grassland. | *Acacia jennerae*  
*Acacia ligulata*  
*Acacia prinii*  
*Eragrostis eriopoda*  
*Eucalyptus eremicola* subsp. *peeneri*  
*Grevillea juncifolia*  
*Grevillea sarissa*  
*Halgrania cyanea*  
*Scaevola tomentosa*  
*Solanum lasiophyllum* | | |
|      | **Extent: 315.1 ha**  
**Average species richness: 5.4 ± 1.5**  
**Landform: Plain, sandy plain**  
**Number of quadrats: 7** | | | |
| R    | *Melaleuca xerophila* open tall shrubland, over *Muellerolimon salicorniacum* sparse low shrubland, over *Eragrostis eriopoda* sparse tussock grassland. | *Acacia ayersiana/caesaneura*  
*Amyema microphylla*  
*Enchylaena tomentosa var. tomentosa*  
*Eremophea spinosa*  
*Ptilotus obovatus*  
*Rhagodia drummondi***  
*Rhagodia eremaea*  
*Scaevola spiniscens*  
*Sclerolaena bicorns*  
*Sclerolaena obliquicuspis*  
*Senna artemisioides*  
*Solanum lasiophyllum* | | |
|      | **Extent: 404.0 ha**  
**Average species richness: 5.4 ± 1.5**  
**Landform: Plain, sandy plain**  
**Number of quadrats: 7** | | | |
| W    | *Eucalyptus striaticalyx* sparse low woodland, over *Grevillea sarissa* sparse tall shrubland, over *Lawrencia helmsii* sparse low shrubland. | *Acacia oswaldii*  
*Atriplex amnicola*  
*Atriplex nana*  
*Enchyilaena tomentosa var. tomentosa*  
*Eragrostis falcata*  
*Eragrostis lanipes*  
*Eragrostis setifolia*  
*Eremophila latrobei*  
*Eremophila margarethae*  
*Frankenia pauciflora sens. lat.*  
*Maireana pentatropis*  
*Sclerolaena fimbriolata* | | |
|      | **Extent: 172.9 ha**  
**Average species richness: 5.6 ± 3.2**  
**Landform: Floodplain, salt pan, tributary**  
**Number of quadrats: 8** | | | |
<table>
<thead>
<tr>
<th>Code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Associated species</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECT (S, T, U, V)</td>
<td>Tecticornia spp. sparse low mixed shrubland.</td>
<td>Extent: 4,184.6 ha</td>
<td>Atriplex bunburyana</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average species richness: n/a</td>
<td>Disphyma crassifolium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Landform: Salt lake, salt pan, low depressions</td>
<td>Eremophila glabra</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of quadrats: 68</td>
<td>Frankenia spp.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muiraea luehmannii</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muellerolimon salicorniaceum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Panicum effusum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sclerolaena deserticola</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sclerolaena fimbriolata</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solanum lasiophyllum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Zygophyllum aurantiacum</td>
<td></td>
</tr>
</tbody>
</table>
Vegetation mapping - West Creek Borefield
Legend

- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Vegetation mapping - Lake Way Deposit

Kilometres

Absolute Scale - 1:55,000

Figure: 4.8
Project ID: 1625
Drawn: MH
Date: 29/03/2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994
Vegetation mapping - Haul Road

Legend

- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Figure: 4.11
Project ID: 1625
Date: 31/03/2016

Drawn: MH

Absolute Scale - 1:63,000
Legend

Wiluna Uranium Project Study Area
Extension to the Wiluna Uranium Project Study Area

Vegetation mapping - Haul Road

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Figure: 4.12
Project ID: 1625
Drawn: MH
Date: 29/03/2015

Absolute Scale - 1:63,000

Kilometres
Legend

- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Vegetation mapping - Haul Road

Figure: 4.13
Project ID: 1625

Kilometres

265000 270000 275000 280000

7005000 7010000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX,
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Date: 29/03/2015

Drawn: MH
Legend

Wiluna Uranium Project Study Area
Extension to the Wiluna Uranium Project Study Area

Kilometres

0 1 2

Absolute Scale - 1:63,000

Vegetation mapping - Haul Road

Figure: 4.14
Project ID: 1625
Drawn: MH
Date: 29/03/2015

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Geoamap, i-cubem, IGN, IGP, swisstopo, and the GIS User Community
Vegetation mapping
Lake Maitland Borefield

Legend
- Wiluna Uranium Project Study Area
- Extension to the Wiluna Uranium Project Study Area

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Figure: 4.16
Project ID: 1625
Drawn: MH
Date: 31/03/2016

Absolute Scale - 1:80,000
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5 DISCUSSION

5.1 VEGETATION CONSERVATION SIGNIFICANCE ASSESSMENT

5.1.1 Vegetation of National Significance

No TECs, or vegetation units likely to be classified TECs, were located within the project areas and therefore no vegetation units of National significance were recorded.

5.1.2 Vegetation of State Significance

No State listed TECs, or vegetation units likely to be TECs were recorded at the project areas. Eleven PECs were recorded as occurring within 50 km of the study area, of which five occur within:

- Barwidgee calcrete groundwater assemblage type on Carey palaeodrainage on Barwidgee Station;
- Hinkler Well calcrete groundwater assemblage type on Carey palaeodrainage on Lake Way Station;
- Lake Violet south and lake Violet calcrete groundwater assemblage types on Carey palaeodrainage on Millbillillie Station; and
- Uramurdah Lake calcrete groundwater assemblage type on Carey palaeodrainage on Millbillillie Station; and
- Wiluna BF calcrete groundwater assemblage type on Carey palaeodrainage on Millbillillie Station.

The five PECs that occur at the study area are underground invertebrate assemblages and are not pertinent to the flora and vegetation. The closest PECs that are relevant to flora and vegetation are the Wiluna West vegetation complexes on BIF, 35 km west and the Violet Range vegetation complexes on BIF, 40 km south. There is no BIF habitat at the study area and no vegetation units at the study area that resemble these PECs. Therefore no vegetation units of State significance occur at the study area.

5.1.3 Vegetation of Regional Significance

An assessment of the significance of the vegetation within the project areas at a regional level is constrained by the lack of mapping across the region at a scale comparable to the mapping during the current assessment. The only source of vegetation mapping available across the Murchison is that conducted by Beard (1976) and digitised by Shepherd et al. (2001), at a scale of 1:1,000,000. As it is completed at such a large scale it does not accurately represent the mapped communities at the study area, especially the minor details including drainage channels, creeklines and low hill slopes. If a vegetation unit mapped at the study area can be attributed to a Beard vegetation unit, it can be used to loosely determine the potential regional distribution of this community in the region.

The thirteen Beard vegetation units mapped at the study area have been compared to the vegetation units that have been consolidated for the current assessment in Table 5.1. Using the total mapped area of each Beard unit in the Murchison region, eight units have restricted distributions. They are: 11, 40, 182, 188, 204, 560, 561 and 676. These units are generally associated with salt lakes or saline depressions and often have a Chenopodiaceae understory.
Table 5.1 – Comparing Beard mapping and vegetation units for regional significance

<table>
<thead>
<tr>
<th>Unit code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Corresponding Beard unit</th>
<th>Percentage of the total area mapped in the Murchison* (&amp; regional distribution)</th>
<th>Potential regional distribution</th>
</tr>
</thead>
</table>
| AA        | *Acacia tetragonophylla* sparse tall shrubland, over *Senna artemisioides* and *Ptilotus obovatus* sparse low shrubland. | Extent: 3,070.2 ha  
Average species richness: 8.8 ± 3.4  
Landform: Plain  
Number of quadrats: 24                                                                 | 204: Succulent steppe with open scrub; scattered Mulga & *Acacia sclerosperma* over saltbush & bluebush   | 0.9% (Restricted)                                                                                       | Low: also recorded at the borefields in other widespread units                |
| AB        | *Acacia tetragonophylla*, *Acacia victoriae* and *Ptilotus obovatus* sparse low shrubland.                  | Extent: 1,512.1 ha  
Average species richness: 5.8 ± 1.9  
Landform: Plain  
Number of quadrats: 5                                                                 | 188: Shrublands; Mulga and *Acacia sclerosperma* scrub                                                                 | <0.1% (Restricted)                                                                                      | High                           |
| AC        | *Eucalyptus camaldulensis* subsp. *obtusa* sparse low woodland, over *Acacia aptaneura* and *Acacia tetragonophylla* sparse tall shrubland, over *Eremophila longifolia*, *Senna artemisioides* and *Scaevola spinescens* sparse mid shrubland. | Extent: 3,009.2 ha  
Average species richness: 10.5 ± 3.6  
Landform: Plain  
Number of quadrats: 15                                                                 | 11: Medium woodland; coolabah (*Eucalyptus microtheca*)                                                                 | <0.1% (Restricted)                                                                                      | High                           |
| BA        | *Acacia aneura*/aptaneura* sparse low woodland, over *Acacia tetragonophylla* (+/-*Melaleuca hamata*) sparse tall shrubland, over *Senna artemisioides*, *Scaevola spinescens* and *Rhagodia drummondii* sparse mid shrubland, over *Ptilotus obovatus*, *Maireana villosa*, *Sclerolaena diacantha* and *Cratystylis subspinescens* sparse low shrubland. | Extent: 92.3 ha  
Average species richness: 14.5 ± 3.3  
Landform: Plain  
Number of quadrats: 13                                                                 | 676: Succulent steppe; Samphire                                                                        | 1.8% (Restricted)                                                                                      | High                           |
| BB        | *Casuarina pauper* open low woodland, over *Eremophila pantoni*, *Eremophila longifolia* and *Eremophila latrobei* sparse mid shrubland, over *Scaevola spinescens*, *Exacarpos aphyllus*, *Rhagodia drummondii* and *Ptilotus obovatus* sparse low shrubland. | Extent: 1,376.4 ha  
Average species richness: 15.7 ± 2.3  
Landform: Plain  
Number of quadrats: 7                                                                 | 676: Succulent steppe; Samphire                                                                        | 1.8% (Restricted)                                                                                      | High                           |
| BC        | *Scaevola spinescens*, *Eremophila malacoides*, *Rhagodia drummondii*, *Maireana villosa* and *Eremophila glabra* sparse low shrubland, over *Enteropogon ramosus* sparse tussock grassland. | Extent: 70.2 ha  
Average species richness: 11.3 ± 2.3  
Landform: Plain  
Number of quadrats: 3                                                                 | 29: Sparse low woodland; Mulga, discontinuous in scattered groups                                        | 14.3% (Widespread)                                                                                     | Low                            |
<table>
<thead>
<tr>
<th>Unit code</th>
<th>Vegetation unit description</th>
<th>Mapped extent, average species richness, landform and quadrats</th>
<th>Corresponding Beard unit</th>
<th>Percentage of the total area mapped in the Murchison* (regional distribution)</th>
<th>Potential regional distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD</td>
<td>Acacia aneura/aptaneura sparse low woodland, over Maireana pyramidata, Maireana triptera and Atriplex bunburyana open low shrubland.</td>
<td>Extent: 180.3 ha Average species richness: 10.7 ± 3.8 Landform: Plain Number of quadrats: 6</td>
<td>676: Succulent steppe; Samphire</td>
<td>1.8% (Restricted)</td>
<td>High</td>
</tr>
<tr>
<td>CA</td>
<td>Acacia aneura/aptaneura sparse low woodland, over Acacia burkittii open tall shrubland, over Eremophila galeata, Eremophila compacta, Senna sp. Meekatharra (E. Bailey 1-26), Senna artemisiodioides and Sida ectogama sparse mid shrubland, over Monachather paradoxus open tussock grassland.</td>
<td>Extent: 34.6 ha Average species richness: 16 ± 4.5 Landform: Undulating plain and rocky hillslope Number of quadrats: 6</td>
<td>39: Shrublands; Mulga scrub</td>
<td>5.5% (Moderate)</td>
<td>Moderate: restricted to hill slopes</td>
</tr>
<tr>
<td>CB</td>
<td>Acacia aneura/aptaneura open low woodland, over Acacia burkittii and Acacia tetragonophylla sparse tall shrubland, over Senna artemisiodioides x artemisiodioides, Senna glaucifolia and Eremophila galeata open mid shrubland, over Aristida contorta open tussock grassland.</td>
<td>Extent: 6.6 ha Average species richness: 27.5 ± 2.1 Landform: Drainage line Number of quadrats: 2</td>
<td>39: Shrublands; Mulga scrub</td>
<td>5.5% (Moderate)</td>
<td>Moderate: restricted to drainage lines</td>
</tr>
<tr>
<td>CC</td>
<td>Acacia pteraneura/macrannea isolated low trees, over Eremophila galeata, Senna artemisiodioides and Sida ectogama sparse mid shrubland, over Eragrostis eriopoda and Monachather paradoxus open tussock grassland.</td>
<td>Extent: 122.2 ha Average species richness: 13.5 ± 4.1 Landform: Plain Number of quadrats: 13</td>
<td>39: Shrublands; Mulga scrub</td>
<td>5.5% (Moderate)</td>
<td>Low</td>
</tr>
<tr>
<td>CD</td>
<td>Acacia aneura/aptaneura, Acacia pteraneura/macrannea and Acacia craspedocarpa low woodland, over Eremophila gilesii, Eremophila galeata and Senna artemisiodioides sparse mid shrubland, over Sida sp. verrucose glands (F.H. Mollemans 2423), Solanum lasiophyllum and Abutilon cryptopetalum sparse low shrubland, over Digitaria brownii, Eragrostis eriopoda and Monachather paradoxus sparse tussock grassland.</td>
<td>Extent: 25.4 ha Average species richness: 19.1 ± 3.6 Landform: Plain, floodplain, drainage lines Number of quadrats: 8</td>
<td>18: Low woodland; Mulga (Acacia aneura)</td>
<td>59.9% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29: Sparse low woodland; Mulga, discontinuous in scattered groups</td>
<td>14.3% (Widespread)</td>
</tr>
<tr>
<td>Unit code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Corresponding Beard unit</td>
<td>Percentage of the total area mapped in the Murchison* (&amp; regional distribution)</td>
<td>Potential regional distribution</td>
</tr>
<tr>
<td>-----------</td>
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<td>---------------------------------------------------------------</td>
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<tr>
<td>D</td>
<td>Acacia aneura/aptaneura and Acacia ayersiana/caesaneura open low woodland (+/-Acacia tetragonophylla and Acacia pruinocarpa), over Eremophila forrestii, Eremophila latrobei and Eremophila foliassima sparse mid shrubland, over Eragrostis eriopoda sparse tussock grassland and Triodia melvillei sparse hummock grassland.</td>
<td>Extent: 9,335.4 ha Average species richness: 9.3 ± 2.7 Landform: Plain, floodplain, drainage lines Number of quadrats: 41</td>
<td>18: Low woodland; Mulga (Acacia aneura)</td>
<td>59.9% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>E</td>
<td>Acacia aneura/aptaneura/ayersiana/caesaneura (+/-Eucalyptus gypophila) sparse low woodland, over Acacia nyssophylla, Eremophila arachnoides subsp. arachnoides and Acacia victoriae sparse mid to tall shrubland, over Ptilotus obvatus, Sclerolaena obliquicuspis and Rhagodia eremaea sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>Extent: 960.6 ha Average species richness: 6.5 ± 3.4 Landform: Plain Number of quadrats: 17</td>
<td>560: Mosaic: Shrublands; Bowgada scrub / succulent steppe; Samphire</td>
<td>0.4% (Restricted)</td>
<td>High</td>
</tr>
<tr>
<td>F</td>
<td>+/-Acacia victoriae and/or Melaleuca interioris sparse tall shrubland, over Eremophila glabra, Scaevola spinescens, Rhagodia eremaea and Lycium australis sparse mid to tall shrubland.</td>
<td>Extent: 137.4 ha Average species richness: 6 ± 2.3 Landform: Plain Number of quadrats: 12</td>
<td>204: Succulent steppe with open scrub; scattered Mulga &amp; Acacia sclerosperma over saltbush &amp; bluebush</td>
<td>0.7% (Restricted)</td>
<td>High</td>
</tr>
<tr>
<td>G</td>
<td>Acacia incurvaneura low woodland (+/-Acacia craspedocarpa and Acacia ramulosa var. linophylla), over Eremophila maculata and Scaevola spinescens mid shrubland over Triodia melvillei open hummock grassland.</td>
<td>Extent: 95.0 ha Average species richness: 6 ± 2.3 Landform: Plain Number of quadrats: 12</td>
<td>107: Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmii over hard spinifex</td>
<td>13.5% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>H</td>
<td>+/-Eucalyptus striatocalyx and Acacia aneura/aptaneura sparse low woodland, over Eremophila glabra and Senna artemisioides sparse mid shrubland, over Dissocarpus paradoxus, Eremophila oppositifolia and Sclerolaena bicornis sparse low shrubland.</td>
<td>Extent: 6.2 ha Average species richness: 5.8 ± 1.9 Landform: Plain Number of quadrats: 4</td>
<td>204: Succulent steppe with open scrub; scattered Mulga &amp; Acacia sclerosperma over saltbush &amp; bluebush</td>
<td>0.7% (Restricted)</td>
<td>High</td>
</tr>
<tr>
<td>I</td>
<td>+/-Acacia aneura/aptaneura isolated low trees, over Lycium australis, Rhagodia drummondii, Frankenia pauciflora sens. lat. and Lawrencia squamata open low shrubland.</td>
<td>Extent: 1,144.9 ha Average species richness: 5.7 ± 2.9 Landform: Plain, floodplain Number of quadrats: 4</td>
<td>676: Succulent steppe; Samphire</td>
<td>1.8% (Restricted)</td>
<td>Moderate: potentially restricted to near salt lakes</td>
</tr>
<tr>
<td>Unit code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Corresponding Beard unit</td>
<td>Percentage of the total area mapped in the Murchison* (&amp; regional distribution)</td>
<td>Potential regional distribution</td>
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<tr>
<td>J</td>
<td>+/-Casuarina pauper sparse low woodland, over Atriplex bunburyana, Lycium australe, Lawrencia squamata and Ptilotus ovatus sparse low to mid shrubland, over Eragrostis setifolia sparse tussock grassland.</td>
<td>Extent: 697.6 ha Average species richness: 9.7 ± 2.5 Landform: Plain, floodplain, near salt lakes Number of quadrats: 15</td>
<td>676: Succulent steppe; Samphire</td>
<td>1.8% (Restricted)</td>
<td>Moderate: potentially restricted to near salt lakes</td>
</tr>
<tr>
<td>K</td>
<td>Casuarina obesa open low woodland, over Acacia nyssophylla sparse tall shrubland, over Lycium australe and Sclerolaena fimbriata sparse low shrubland.</td>
<td>Extent: 19.7 ha Average species richness: 5.3 ± 0.6 Landform: Plain Number of quadrats: 3</td>
<td>676: Succulent steppe; Samphire</td>
<td>1.8% (Restricted)</td>
<td>Moderate: potentially restricted to near salt lakes</td>
</tr>
<tr>
<td>L</td>
<td>+/-Acacia aneura/aptaneura and Hakea lorea subsp. lorea isolated low trees, over Alyogyne pinoniana, Androcalva laxophylla, Solanum caeciliferum and Leptospermum chambersii sparse low shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda sparse tussock grassland.</td>
<td>Extent: 5,827.5 ha Average species richness: 8 ± 3.6 Landform: Sandy plain Number of quadrats: 27</td>
<td>29: Sparse low woodland; Mulga, discontinuous in scattered groups 107: Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmillii over hard spinifex</td>
<td>14.3% (Widespread) 13.5% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Acacia aneura/aptaneura (+/-Acacia ayersiana/caesaneura) open low woodland, over Eremophila forrestii, Eremophila spectabilis subsp. brevis open mid shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda and Monachather paradoxus sparse tussock grassland.</td>
<td>Extent: 6,370.4 ha Average species richness: 12.8 ± 3.5 Landform: Plain, sandy plain Number of quadrats: 37</td>
<td>18: Low woodland; Mulga (Acacia aneura) 29: Sparse low woodland; Mulga, discontinuous in scattered groups 107: Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmillii over hard spinifex</td>
<td>59.9% (Widespread) 14.3% (Widespread) 13.5% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>N</td>
<td>Acacia ayersiana/caesaneura open low woodland (+/-Acacia aneura/aptaneura and Eucalyptus eremicola subsp. peeneri) open low woodland, over +/-Melaleuca interioris sparse tall shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda sparse tussock grassland.</td>
<td>Extent: 2,088.1 ha Average species richness: 14.7 ± 5.2 Landform: Plain, sandy plain Number of quadrats: 46</td>
<td>29: Sparse low woodland; Mulga, discontinuous in scattered groups 204: Succulent steppe with open scrub; scattered Mulga &amp; Acacia sclerosperma over saltbush &amp; bluebush 560: Mosaic: Shrublands; Bowgada scrub / succulent steppe; Samphire</td>
<td>14.3% (Widespread) 0.9% (Restricted) 0.4% (Restricted)</td>
<td>Low</td>
</tr>
<tr>
<td>Unit code</td>
<td>Vegetation unit description</td>
<td>Mapped extent, average species richness, landform and quadrats</td>
<td>Corresponding Beard unit</td>
<td>Percentage of the total area mapped in the Murchison* (&amp; regional distribution)</td>
<td>Potential regional distribution</td>
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<tr>
<td>O</td>
<td>Acacia ayersiana/caesaneura (+/Eucalyptus eremicola subsp. peeneri) open low woodland, over Triodia melvillei open hummock grassland.</td>
<td>Extent: 4,807.7 ha Average species richness: 9 ± 3 Landform: Plain, sandy plain Number of quadrats: 55</td>
<td>560: Mosaic: Shrublands; Bowgada scrub / succulent steppe; Samphire</td>
<td>0.4% (Restricted)</td>
<td>Low: also recorded at the borefields in other widespread units</td>
</tr>
<tr>
<td>P</td>
<td>+/-Acacia ayersiana/caesaneura (+/Eucalyptus eremicola subsp. peeneri and Eucalyptus kingsmillii) sparse low woodland, over Acacia ligulata and Acacia jamesiana sparse mid shrubland, over Halgania cyanea sparse low shrubs, over Triodia basedowii open hummock grassland.</td>
<td>Extent: 1,234.4 ha Average species richness: 11.6 ± 3.4 Landform: Plain, sandy plain Number of quadrats: 27</td>
<td>107: Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmillii over hard spinifex</td>
<td>13.5% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>Q</td>
<td>Callitris columellaris sparse tall shrubland, over Triodia melvillii open hummock grassland.</td>
<td>Extent: 315.1 ha Average species richness: 5.4 ± 1.5 Landform: Plain, sandy plain Number of quadrats: 7</td>
<td>107: Hummock grasslands, shrub steppe; Mulga and Eucalyptus kingsmillii over hard spinifex</td>
<td>13.5% (Widespread)</td>
<td>Low</td>
</tr>
<tr>
<td>R</td>
<td>Melaleuca xerophila open tall shrubland, over Muellerolimon salicorniaceum sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>Extent: 404.0 ha Average species richness: 5.4 ± 1.5 Landform: Plain, sandy plain Number of quadrats: 7</td>
<td>125: Bare areas; salt lakes</td>
<td>3.4% (Moderate)</td>
<td>High: restricted to the edges of salt lakes</td>
</tr>
<tr>
<td>W</td>
<td>Eucalyptus striaticalyx sparse low woodland, over Grevillea sarissa sparse tall shrubland, over Lawrencia helmsii sparse low shrubland.</td>
<td>Extent: 172.9 ha Average species richness: 5.6 ± 3.2 Landform: Floodplain, salt pan, tributary Number of quadrats: 8</td>
<td>125: Bare areas; salt lakes</td>
<td>3.4% (Moderate)</td>
<td>Moderate: restricted to edges of salt lakes on calcrete</td>
</tr>
<tr>
<td>TECT</td>
<td>Tecticornia spp. sparse low mixed shrubland.</td>
<td>Extent: 4,184.6 ha Average species richness: n/a Landform: Salt lake, salt pan, low depressions Number of quadrats: 68</td>
<td>125: Bare areas; salt lakes</td>
<td>3.4% (Moderate)</td>
<td>High: restricted to salt pans. Locally common.</td>
</tr>
</tbody>
</table>

* Based on sum of all Beard vegetation units mapped for the Murchison.
5.1.4 Vegetation of Local Significance

The local conservation significance of the 28 vegetation units recorded during the consolidation is assessed in Table 5.2. Of these, two are considered to have a high local significance (R and TECT), twelve have a moderate local significance and 14 have a low local significance.

Vegetation units with a high local significance that are equivalent to vegetation considered to be of potential significance in previous flora and vegetation assessments (Table 5.3) are discussed below:

**Vegetation consolidation assessment:**

**R:** *Melaleuca xerophila* open tall shrubland, over *Muellerolimon salicorniaceum* sparse low shrubland, over *Eragrostis eriopoda* sparse tussock grassland is associated with Beard unit 125, a restricted unit mapped as only 3.4% of the Murchison. This unit is also restricted to areas fringing salt lakes, which is even more restricted and is therefore given high local significance. Equivalent vegetation was also considered to be potentially significant in previous flora and vegetation assessments (Outback Ecology 2007, Niche 2011 and Actis 2012, Table 5.3).

**TECT:** *Tecticornia* spp. sparse low shrubland is associated with Beard vegetation units 676 and 125, both restricted units mapped as occurring across 1.8% and 3.4%, respectively of the Murchison. It is recorded on saline depressions, a very restricted landform and is also is habitat for Priority flora including *Frankenia confusa*, *Stackhousia clementii* and *Tecticornia cymbiformis* and is therefore given high local significance. This unit also includes vegetation considered to be of potential significance in previous flora and vegetation assessments (Outback Ecology 2007, Niche 2011, Actis 2012 and Niche 2014, Table 5.3).

**Corresponding to other assessments vegetation of significance:**

**AC:** *Eucalyptus camaldulensis* subsp. *obtusa* sparse low woodland, over *Acacia aptaneura* and *Acacia tetragonophylla* sparse tall shrubland, over *Eremophila longifolia*, *Senna artemisioides* and *Scaevola spinescens* sparse mid shrubland, includes the Cr vegetation unit considered to be of potential significance in a previous flora and vegetation assessment (Niche 2011, Table 5.3).

**D:** *Acacia aneura/aptaneura/ayersiana/caesaneura* open low woodland (+/-*Acacia tetragonophylla* and *Acacia pruinocarpa*), over *Eremophila forrestii*, *Eremophila latrobei*, *Eremophila foliosissima* sparse mid shrubland, over *Eragrostis eriopoda* sparse tussock grassland and *Triodia melvillei* sparse hummock grassland, includes the BIF and Sh complex vegetation units considered to be of potential significance in a previous flora and vegetation assessment (Niche 2011, Table 5.3).

**E:** *Acacia aneura/aptaneura/ayersiana/caesaneura* (+/-*Eucalyptus gypsophila*) sparse low woodland, over *Acacia nyssophylla*, *Eremophila arachnoides* subsp. arachnoides and *Acacia victoriae* sparse mid to tall shrubland, over *Ptilotus obovatus*, *Sclerolaena obliquicuspis* and *Rhadodia eremaea* sparse low shrubland, over *Eragrostis eriopoda* sparse tussock grassland, includes the Ca1 vegetation unit considered to be of potential significance in previous flora and vegetation assessments (Niche 2011 and Niche 2014, Table 5.3).

**W:** *Eucalyptus striaticalyx* sparse low woodland, over *Grevillea sarissa* sparse tall shrubland, over *Lawrencea helmsii* sparse low shrubland, is equivalent to the vegetation unit KRE considered to be of potential significance in a previous flora and vegetation assessment (Outback Ecology 2009, Table 5.3).
<table>
<thead>
<tr>
<th>Unit</th>
<th>Vegetation description</th>
<th>Total area (ha)</th>
<th>Landform &amp; potential local distribution of landform</th>
<th>Regional significance</th>
<th>Mean species richness</th>
<th>Priority species</th>
<th>Assigned local significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Acacia tetragonophylla sparse tall shrubland, over Senna artemisioides and Ptilotus obovatus sparse low shrubland.</td>
<td>3,070.2</td>
<td>Plain: widespread</td>
<td>Low</td>
<td>8.8</td>
<td>Eremophila arachnoides (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>AB</td>
<td>Acacia tetragonophylla, Acacia victoriae and Ptilotus obovatus sparse low shrubland.</td>
<td>1,512.1</td>
<td>Plain: widespread</td>
<td>High</td>
<td>5.8</td>
<td>Eremophila arachnoides subsp. arachnoides (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>AC</td>
<td>Eucalyptus camaldulensis subsp. obtusa sparse low woodland, over Acacia aptaneura and Acacia tetragonophylla sparse tall shrubland, over Eremophila longifolia, Senna artemisioides and Scaevola spinescens sparse mid shrubland.</td>
<td>3,009.2</td>
<td>Plain: widespread</td>
<td>High</td>
<td>10.5</td>
<td>Stackhousia clementii (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>BA</td>
<td>Acacia aneura/aptaneura sparse low woodland, over Acacia tetragonophylla (+/- Melaleuca hamata) sparse tall shrubland, over Senna artemisioides, Scaevola spinescens and Rhagodia drummondii sparse mid shrubland, over Ptilotus obovatus, Maireana villosa, Scleraena diacantha and Cratystylis subsinuata sparse low shrubland.</td>
<td>92.3</td>
<td>Plain near salt lakes: moderately widespread</td>
<td>High</td>
<td>14.5</td>
<td>Tecticornia cymbiformis (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>BB</td>
<td>Casuarina pauper open low woodland, over Eremophila pantoni, Eremophila longifolia and Eremophila latrobei sparse mid shrubland, over Scaevola spinescens, Exocarpos aphyllus, Rhagodia drummondii and Ptilotus obovatus sparse low shrubland.</td>
<td>1,376.4</td>
<td>Floodplain: moderately widespread</td>
<td>High</td>
<td>15.7</td>
<td>Cratystylis centralis (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>BC</td>
<td>Scaevola spinescens, Eremophila malacoides, Rhagodia drummondii, Maireana villosa and Eremophila globra sparse low shrubland, over Enteropogon ramosus sparse tussock grassland.</td>
<td>70.2</td>
<td>Plain: widespread</td>
<td>Low</td>
<td>11.3</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>BD</td>
<td>Acacia aneura/aptaneura sparse low woodland, over Maireana pyramidata, Maireana triptera and Atriplex bunburyana open low shrubland.</td>
<td>180.3</td>
<td>Plain: widespread</td>
<td>High</td>
<td>10.7</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>CA</td>
<td>Acacia aneura/aptaneura sparse low woodland, over Acacia burkittii open tall shrubland, over Eremophila galeata, Eremophila compacta, Senna sp. Meekatharra (E. Bailey 1-26), Senna artemisioides and Sida ectogama sparse mid shrubland, over Monachather paradoxus open tussock grassland.</td>
<td>34.6</td>
<td>Undulating plain, rocky hillslope: restricted</td>
<td>Moderate</td>
<td>16</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>CB</td>
<td>Acacia aneura/aptaneura open low woodland, over Acacia burkittii and Acacia tetragonophylla sparse tall shrubland, over Senna artemisioides x artemisioides, Senna glaucifolia and Eremophila galeata open mid shrubland, over Aristida contorta open tussock grassland.</td>
<td>6.6</td>
<td>Drainage line: restricted</td>
<td>Moderate</td>
<td>27.5</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>CC</td>
<td>Acacia pteraneura/macraneeura isolated low trees, over Eremophila galeata, Senna artemisioides and Sida ectogama sparse mid shrubland, over Eragrostis eriopoda and Monachather paradoxus open tussock grassland.</td>
<td>122.2</td>
<td>Plain: widespread</td>
<td>Low</td>
<td>13.5</td>
<td>-</td>
<td>Low</td>
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<tr>
<td>Unit</td>
<td>Vegetation description</td>
<td>Total area (ha)</td>
<td>Landform &amp; potential local distribution of landform</td>
<td>Regional significance*</td>
<td>Mean species richness</td>
<td>Priority species</td>
<td>Assigned local significance</td>
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<tr>
<td>CD</td>
<td>Acacia aneura/aptaneura, Acacia pteraneura/macraneura and Acacia craspedocarpa low woodland, over Eremophila gilesii, Eremophila galeata and Senna artemisioides sparse mid shrubland, over Sida sp. verrucose glands (F.H. Mollemans 2423), Solanum lasiophyllum and Abutilon cryptopetalum sparse low shrubland, over Digitaria brownii, Eragrostis eriopoda and Monachather paradoxus sparse tussock grassland.</td>
<td>25.4</td>
<td>Plain, floodplain, drainage line: widespread</td>
<td>Low</td>
<td>19.1</td>
<td>-</td>
<td>Low</td>
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<tr>
<td>D</td>
<td>Acacia aneura/aptaneura/ayersiana/caesaneura open low woodland (+/-Acacia tetragonophylla and Acacia pruinocarpa), over Eremophila forrestii, Eremophila latrobei and Eremophila foliosissima sparse mid shrubland, over Eragrostis eriopoda sparse tussock grassland and Triodia melvillei sparse hummock grassland.</td>
<td>9,335.4</td>
<td>Plain: widespread</td>
<td>Low</td>
<td>9.3</td>
<td>Eremophila pungens (P4)</td>
<td>Low</td>
</tr>
<tr>
<td>E</td>
<td>Acacia aneura/aptaneura/ayersiana/caesaneura (+/-Eucalyptus gypsymphila) sparse low woodland, over Acacia nyssophylla, Eremophila arachnoideas subsp. arachnoideas and Acacia victoriae sparse mid to tall shrubland, over Ptilotus obovatus, Sclerolaena obliquicuspis and Rhagodia eremaea sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>960.6</td>
<td>Plain: widespread</td>
<td>High</td>
<td>6.5</td>
<td>Eremophila arachnoideas subsp. arachnoideas (P3)</td>
<td>Low</td>
</tr>
<tr>
<td>F</td>
<td>+/-Acacia victoriae and/or Melaleuca interioris sparse tall shrubland, over Eremophila glabra, Scaevola spinescens, Rhagodia eremaea and Lycium australis sparse low shrubland.</td>
<td>137.4</td>
<td>Plain: widespread</td>
<td>High</td>
<td>2.3</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>G</td>
<td>Acacia incurvaneura low woodland (+/-Acacia craspedocarpa and Acacia ramulosa var. linophylla), over Eremophila maculata and Scaevola spinescens mid shrubland over Triodia melvillei open hummock grassland.</td>
<td>95.0</td>
<td>Plain: widespread</td>
<td>Low</td>
<td>6</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>H</td>
<td>+/-Eucalyptus striaticalyx and Acacia aneura/aptaneura sparse low woodland, over Eremophila glabra and Senna artemisioides sparse mid shrubland, over Dissocarpus paradoxus, Eremophila oppositifolia and Sclerolaena bicorns sparse low shrubland.</td>
<td>6.2</td>
<td>Plain: widespread</td>
<td>High</td>
<td>6.2</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>I</td>
<td>+/-Acacia aneura/aptaneura isolated low trees, over Lycium australis, Rhagodia drummondii, Frankenia pauciflora sens. lat. and Lawrencia squamata open low shrubland.</td>
<td>1,144.9</td>
<td>Plain and floodplain: widespread</td>
<td>Moderate</td>
<td>5.7</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>J</td>
<td>+/-Casuarina pauper sparse low woodland, over Atriplex bunburyana, Lycium australis, Lawrencia squamata and Ptilotus obovatus sparse low to mid shrubland, over Eragrostis setifolia sparse tussock grassland.</td>
<td>697.6</td>
<td>Plain and floodplain: moderately widespread</td>
<td>Moderate</td>
<td>9.7</td>
<td>Eremophila arachnoideas subsp. arachnoideas (P3)</td>
<td>Moderate</td>
</tr>
<tr>
<td>Unit</td>
<td>Vegetation description</td>
<td>Total area (ha)</td>
<td>Landform &amp; potential local distribution of landform</td>
<td>Regional significance*</td>
<td>Mean species richness</td>
<td>Priority species</td>
<td>Assigned local significance</td>
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</tr>
<tr>
<td>K</td>
<td>Casuarina obesa open low woodland, over Acacia nyssophylla sparse tall shrubland, over Lycium australe and Sclerolaena fimbriolata sparse low shrubland.</td>
<td>19.7</td>
<td>Plain and floodplain: moderately widespread</td>
<td>Moderate</td>
<td>19.7</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>L</td>
<td>+/-Acacia aneura/aptaneura and Hakea lorea subsp. lorea isolated low trees, over Alyogyne pinoniana, Androcalva laxophylla, Solanum coactiliferum and Leptosema chambersii sparse low shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda sparse tussock grassland.</td>
<td>5,827.5</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>8</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>M</td>
<td>Acacia aneura/aptaneura (+/-Acacia ayersiana/ caesaneura) open low woodland, over Eremophila forrestii, Eremophila spectabilis subsp. brevis open mid shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda and Monachather paradoxus sparse tussock grassland.</td>
<td>6,370.4</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>12.8</td>
<td>Eremophila pungens (P4)</td>
<td>Low</td>
</tr>
<tr>
<td>N</td>
<td>Acacia ayersiana/caesaneura open low woodland (+/-Acacia aneura/aptaneura and Eucalyptus eremicola subsp. peeneri) open low woodland, over +/-Melaleuca interioris sparse tall shrubland, over Triodia basedowii open hummock grassland and Eragrostis eriopoda sparse tussock grassland.</td>
<td>2,088.1</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>14.7</td>
<td>Eremophila arachnooides subsp. arachnooides (P3)</td>
<td>Low</td>
</tr>
<tr>
<td>O</td>
<td>Acacia ayersiana/caesaneura (+/-Eucalyptus eremicola subsp. peeneri) open low woodland, over Triodia melvillei open hummock grassland.</td>
<td>4,807.7</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>9</td>
<td>Eremophila arachnooides subsp. arachnooides (P3) Eremophila pungens (P4)</td>
<td>Low</td>
</tr>
<tr>
<td>P</td>
<td>+/-Acacia ayersiana/caesaneura (+/-Eucalyptus eremicola subsp. peeneri and Eucalyptus kingsmillii) sparse low woodland, over Acacia ligulata and Acacia jamesiana sparse mid shrubland, over Halgania cyanea sparse low shrubs, over Triodia basedowii open hummock grassland.</td>
<td>1,234.4</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>11.6</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>Q</td>
<td>Callitris columellaris sparse tall shrubland, over Triodia melvillei open hummock grassland.</td>
<td>315.1</td>
<td>Sandy plain: widespread</td>
<td>Low</td>
<td>5.4</td>
<td>-</td>
<td>Low</td>
</tr>
<tr>
<td>R</td>
<td>Melaleuca xerophila open tall shrubland, over Muellerolimon salicorniaceum sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>404.0</td>
<td>Fringing salt lakes: restricted</td>
<td>High</td>
<td>5.4</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>W</td>
<td>Eucalyptus striaticalyx sparse low woodland, over Grevillea sarissa sparse tall shrubland, over Lawrencia helmsii sparse low shrubland.</td>
<td>172.9</td>
<td>Fringing salt lakes: restricted</td>
<td>Moderate</td>
<td>5.6</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>TECT</td>
<td>Tecticornia spp. sparse low mixed shrubland.</td>
<td>4,184.6</td>
<td>Salt pan: restricted</td>
<td>High</td>
<td>n/a</td>
<td>Frankenia confusa (P4) Stackhausia clementii (P3) Tecticornia cymbiformis (P3)</td>
<td>High</td>
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</table>

* Based on Table 5.1.
Table 5.3 – Comparison of significant vegetation from previous flora and vegetation assessments

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AC</td>
<td>Eucalyptus camaldulensis subsp. obtusa sparse low woodland, over Acacia aptaneura and Acacia tetragonophylla sparse tall shrubland, over Eremophila longifolia, Senna artemisioides and Scaevola spinescens sparse mid shrubland.</td>
<td>-</td>
<td>-</td>
<td>Cr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>Acacia aneura/aptaneura/ayersiana/caesaneura open low woodland (+/-Acacia tetragonophylla and Acacia pruinocarpa), over Eremophila forrestii, Eremophila latrobei and Eremophila foliosissima sparse mid shrubland, over Eragrostis eriopoda sparse tussock grassland and Triodia melvillei sparse hummock grassland.</td>
<td>-</td>
<td>-</td>
<td>BIF/ Sh complex</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>Acacia aneura/aptaneura/ayersiana/caesaneura (+/-Eucalyptus gypsophila) sparse low woodland, over Acacia nyssophylla, Eremophila arachnoidea subsp. arachnoidea and Acacia victoriae sparse mid to tall shrubland, over Pilotus obovatus, Scleroanna obliquicuspis and Rhagodia eremoea sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>-</td>
<td>-</td>
<td>Ca1</td>
<td>-</td>
<td>Ca1</td>
</tr>
<tr>
<td>R</td>
<td>Melaleuca xerophila open tall shrubland, over Muellerolimon salicorniaceum sparse low shrubland, over Eragrostis eriopoda sparse tussock grassland.</td>
<td>Me1</td>
<td>-</td>
<td>Fr1</td>
<td>Fr1</td>
<td>-</td>
</tr>
<tr>
<td>W</td>
<td>Eucalyptus striaticalyx sparse low woodland, over Grevillea sarissa sparse tall shrubland, over Lawrencia helmsii sparse low shrubland.</td>
<td>-</td>
<td>KRE</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TECT</td>
<td>Tecticornia spp. sparse low mixed shrubland.</td>
<td>Halophytic vegetation</td>
<td>-</td>
<td>Sl1</td>
<td>Sl1, Cp2</td>
<td>Sl</td>
</tr>
</tbody>
</table>
6 REFERENCES


EPA. 2002. Terrestrial Biological Surveys as an Element of Biodiversity Protection. Position Statement No. 3. Environmental Protection Authority, Western Australia.


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Provided Electronically:

A.1: Regional site by species matrix
A.2 Significant flora location data
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APPENDIX B  DENDROGRAM