

Figure 7 Vegetation Communities on the Project site



# 6.1 COMMUNITY 1 – SNAPPY GUM OPEN WOODLAND ON STEEP HILLS AND STRIKE RIDGES (RE 1.11.2A)

### 6.1.1 Location

The Snappy Gum woodland on steep hills and strike ridges (RE 1.11.2a) community is located on skeletal soils forming the Knapdale Range and smaller hillocks on the Project site (refer to Figure 7). Snappy Gum was the dominant community on the Project site, spanning over approximately 52.9% (1,816 ha).

## 6.1.2 Community Description

The Snappy Gum Open Woodland (RE 1.11.2a) is dominated by a Snappy Gum (*Eucalyptus leucophloia*) open canopy, a moderate to dense shrub layer of Turpentine (*Acacia chisholmii*) and a grassy layer of Soft Spinifex (*Triodia pungens*) (Photo Plate 1 and Photo Plate 2). Other canopy trees include the Western Bloodwood (*Corymbia terminalis*), *Eucalyptus herbertiana* and Cloncurry Box (*Eucalyptus leucophylla*), with an occasional sparse understory of Arid Peach (*Terminalia aridicola*). Groundcover consists of 45% grass and forbs, 4% bare ground, 1% leaf litter and 50% rock. Canopy cover is approximately 3% with an average height of 4 m. Average species recorded along a Secondary transect in the Snappy Gum Open Woodland is 9 in the dry season and 44 in the wet season.



Photo Plate 1 Snappy Gum Open Woodland – RE 1.11.2a





Photo Plate 2 Snappy Gum Open Woodland – RE 1.11.2a

Species presented within Table 6 are indicative of the dominant species recorded within this community. A full list of species is presented in Appendix B. RE 1.11.2a occurs on strongly folded metamorphic pre-Cambrian rock, along the Knapdale Quartzite geological sequence, with associated mudstone, sandstone, siltstone and shale.

 Table 6
 Community 1 (RE 1.11.2a)- Vegetation Community Description

Community	Snappy Gum Open Woodland on steep hills and strike ridges
Regional Ecosystem	1.11.2a: Low open-woodland of <i>Eucalyptus leucophloia</i> often with <i>Corymbia spp., Terminalia aridicola</i> and <i>Eucalyptus leucophylla</i> with shrub layer of <i>Acacia spp.</i> and ground layer of <i>Triodia spp.</i> Occurs on steep hills and strike ridges (BVG1M: 19a)
Biodiversity Status	No concern at present
VM Act Status	Least concern
EPBC Act	Not listed
Tree Layer	3 – 6 metres <u>Eucalyptus leucophloia</u> , Eucalyptus herbertiana, Corymbia terminalis, Terminalia aridicola, Corymbia aspera



Shrub Layer	1 – 3 metres <u>Acacia monicola, Acacia chisholmii,</u> Acacia elachantha, Acacia chippendalei, Grevillea dryandri, Euphorbia tannensis
Groundcover	0 – 0.6 metre <u>Triodia pungens</u> , Fimbristylis tetragona, Fimbristylis dichotoma, Cymbopogon bombycinus, Indigofera linnaei, Hybanthus enneaspermus, Stackhousia intermedia, Cheilanthes brownii, Chamaecrista symonii, Bonamia media, Polycarpaea corymbosa
Structure Category	Very sparse

## 6.1.3 Conservation Value

### 6.1.3.1 Species

Targeted searches for species of conservation significance were conducted. Ground-truthing identified no species of conservational significance within RE 1.11.2a. The potential on site occurrence of threatened species identified in database searches is described in Table 14

Introduced flora species within RE 1.11.2a include Kapok Bush (*Aerva javanica*), Tickweed (*Cleome viscosa*) and Buffel Grass (*Pennisetum ciliare*). Weed diversity and abundance is relatively low within this RE, as seed dispersal would be limited to wind transport and bird droppings. No weeds of national significance were found within RE 1.11.2a.

### 6.1.3.2 Community

Snappy Gum Open Woodland on steep hills and strike ridges (RE 1.11.2a), is listed as 'Least Concern' under the VMR, 'No Concern at Present' under the DERM Biodiversity Status. This ecological community is not listed under the EPBC Act. Areas in which RE 1.11.2 is under reserve include Lawn Hill (Gregory) Resources Reserve and the Boodjamulla (Lawn Hill) National Park.

Overall, the condition of Snappy Gum Open Woodland (RE 1.11.2a) on the Project site is healthy. Intact stands of this community are abundant in the region and it is unlikely disturbance within the Project site will significantly impact on the regional occurrence of this community.

# 6.2 COMMUNITY 2 – SNAPPY GUM OPEN WOODLAND ON FOOTHILLS (RE 1.11.2E)

### 6.2.1 Location

The Snappy Gum Open Woodland on foothills (RE 1.11.2e) occurs on lower slopes of the Knapdale Range. This community covers approximately 16.2% (555.5 ha) of the Project site. Refer to Figure 7 for community distribution.



# 6.2.2 Community Description

The Snappy Gum Open Woodland (RE 1.11.2e) is dominated by a Snappy Gum (*Eucalyptus leucophloia*) open canopy, with associated Western Bloodwood (*Corymbia terminalis*) and Cloncurry Box (*Eucalyptus leucophylla*), a sparse shrub layer of Turpentine (*Acacia lysiphloia*) and a grassy layer of Soft Spinifex (*Triodia pungens*) (Photo Plate 3). Groundcover consists of 45% grass and forbs, 34% bare ground, 6% leaf litter and 15% ironstone cover. Canopy cover is approximately 3% with an average height of 5.5 m. Average species recorded along a Secondary transect in the Snappy Gum Open Woodland (RE 1.11.2e) is 12 in the dry season and 38 in the wet season.



Photo Plate 3 Snappy Gum Open Woodland – RE 1.11.2e

Species presented within Table 7 are indicative of the dominant species recorded within this community. A full list of species is presented in Appendix B. RE 1.11.2e occurs on strongly folded metamorphic Middle Proterozoic rock, along the Corella Formation and Knapdale Quartzite geological sequences, with associated laminated calcareous siltstone, limestone, scapolitic granofels and minor metabasalts at the top.

 Table 7
 Community 2 (RE 1.11.2e) - Vegetation Community Description

Community	Snappy Gum Open Woodland on foothills
Regional Ecosystem	1.11.2e: Low open-woodland of <i>Eucalyptus leucophylla</i> and <i>E. leucophloia</i> often with <i>Acacia cambagei</i> and <i>Corymbia terminalis</i> with a sparse ground layer of <i>Triodia pungens</i> and/or <i>Triodia longiceps</i> . Occurs on footslopes and lower slopes, broken by creeks and drainages (BVG1M: 19b)



Biodiversity Status	No concern at present
VMR Status	Least concern
EPBC Act	Not listed
Tree Layer	4 – 7 m <u>Eucalyptus leucophloia</u> , Eucalyptus leucophylla, Corymbia terminalis
Shrub Layer	1 – 3 metres <u>Acacia lysiphloia,</u> Acacia monicola, Acacia bidwillii, Acacia holosericea, Acacia retivenea, Carissa lanceolata, Gossypium australe, Hakea cordophylla, Paratephrosia lantana, Tephrosia rosea var rosea, Tephrosia varians, Triumfetta rupestris
Groundcover	0 – 1 metre <u>Triodia pungens</u> , <u>Pennisetum ciliare</u> , Aristida contorta, Cymbopogon bombycinus, Enneapogon polyphyllus, Eriachne mucronata, Bulbostylis barbata, Cyperus vaginatus, Fimbristylis signata, Fimbristylis dichotoma, Crotalaria novae-hollandiae, Crotalaria dissitiflora,
Structure Category	Very sparse

### 6.2.3 Conservation Value

### **6.2.3.1** Species

Targeted searches for species of conservation significance were conducted. Ground-truthing identified no species of conservational significance within RE 1.11.2e at the time of surveys. The potential on site occurrence of threatened species identified in database searches is described in Table 14.

Introduced flora species within RE 1.11.2e include Kapok Bush (*Aerva javanica*), Tickweed (*Cleome viscosa*), Tarvine (*Boerhavia paludosa*), Colocynth (*Citrullus colocynthis*), Buffel Grass (*Pennisetum ciliare*) and Cloncurry Buffel Grass (*Pennisetum pennisetiforme*). The Buffel Grass (*Pennisetum ciliare*) was co-dominant with Soft Spinifex (*Triodia pungens*) in areas adjacent to ephemeral watercourses. No weeds of national significance were found.

## 6.2.3.2 Community

Snappy Gum Open Woodland on foothills (RE 1.11.2e), is listed as 'Least Concern' under the VMR, 'No Concern at Present' under the DERM Biodiversity Status and is not classed as a listed ecological community under the EPBC Act. Areas in which RE 1.11.2 is under reserve include Lawn Hill (Gregory) Resources Reserve and the Boodjamulla (Lawn Hill) National Park.

Intact stands of this community are abundant in the region, with greater than 10,000 ha of the statewide extent of this RE remaining. It is unlikely disturbance within the Project site will significantly impact on the regional occurrence or integrity of this community



# 6.3 COMMUNITY 3 – CLONCURRY BOX OPEN WOODLAND ON LOW BROAD HILLS (RE 1.11.3A)

### 6.3.1 Location

Cloncurry Box Open Woodland on low broad hills (RE 1.11.3a) occurred along the western foothills of the Knapdale Range. This community covers approximately 10.6% (365.5 ha) of the Project site (refer to Figure 7).

# 6.3.2 Community Description

The Cloncurry Box Open Woodland on low broad hills (RE 1.11.3a) is dominated by a low canopy of Cloncurry Box (*Eucalyptus leucophylla*), with associated Western Bloodwood (*Corymbia terminalis*), Ghost Gum (*Corymbia aparrerinjia*) and an infrequent understory of Whitewood (*Atalaya hemiglauca*) (Photo Plate 4). The shrub layer is sparsely dominated by Turpentine. Groundcover consists of 70% Soft Spinifex, 10% rock, 15% bare ground and 5% leaf litter. Canopy cover averages 11% with a height of 4 m. Floristic diversity was relatively lower than other communities, with an average of 6 species during the dry season and 32 species during the wet season were recorded along each Secondary transect.



Photo Plate 4 Cloncurry Box Open Woodland - RE 1.11.3a

Species presented within Table 8 are indicative of the dominant species recorded within this community. A full list of species is presented in Appendix B. This community occurs on the Knapdale Quartzite geological sequence on siltstone, shale, metabasalts and dolerites.



Table 8 Community 3 (RE 1.11.3a) - Vegetation Community Description

Community	Cloncurry Box Open Woodland on low broad hills
Regional Ecosystem	1.11.3a: Low open-woodland <i>Eucalyptus leucophylla</i> often with <i>Corymbia terminalis</i> , <i>Corymbia aparrerinja</i> and <i>Atalaya hemiglauca</i> with scattered shrubs of <i>Acacia chisholmii</i> and a sparse ground layer of <i>Triodia pungens</i> . Occurs on broad low hills; metamorphosed igneous rocks (BVG1M: 19b)
Biodiversity Status	No concern at present
VMR Status	Least concern
EPBC Act	Not listed
Tree Layer	3 – 5 metres <u>Eucalyptus leucophylla, Corymbia terminalis</u> , Corymbia aparrerinja, Atalaya hemiglauca
Shrub Layer	1 – 3 metres <u>Acacia chisholmii,</u> Acacia retivena, Acacia monitcola, Grevillea striata, Acacia holosericea, Carissa lanceolata, Eremophila latrobei, Eremophila longifolia, Sesbania campylocarpa, Tephrosia flagellaris
Groundcover	0 – 0.7 metre <u>Triodia pungens</u> , Pennisetum ciliare, Aristida inaequiglumis, Enneapogon polyphyllus, Eragrostis fallax, Eulalia aurea, Heteropogon contortus, Fimbristylis microcarya, Crotalaria aridicola, Sida cordifolia, Hybanthus enneaspermus, Vigna radiata var subobata, Indigofera colutea, Pterocaulon sphacelatum, Boerhavia schomburgkiana, Chamaesyce coghlanii, Zornia muriculata
Structure Category	Very sparse

## 6.3.3 Conservation Value

## **6.3.3.1** Species

Targeted searches for species of conservation significance determined that no species of conservation significance inhabit the Cloncurry Box Open Woodland.

No weed species, listed under the LP Act or listed as of national significance, were observed within Cloncurry Box Open Woodland on low broad hills (RE 1.11.3a). Introduced species identified within this community include Mimosa (*Acacia* farnesiana), Kapok Bush (*Aerva javanica*), Cockroach Bush (*Senna notabilis*), Buffel Grass (*Pennisetum ciliare*), Cloncurry Buffel (*Pennisetum pennisetiforme*) and Flannel Weed (*Sida cordifolia*).



#### 6.3.3.2 Community

As detailed in Table 7, Cloncurry Box Open Woodland (RE 1.11.3a) is listed as 'Least Concern' under the VMR, 'No Concern at Present' under the DERM Biodiversity Status and is not listed under the EPBC Act.

Although RE 1.11.3 is not protected within the Northwest Highlands bioregion, intact stands are abundant throughout this Queensland bioregion. The Cloncurry Box Open Woodland on low broad hills (RE 1.11.3a) is not under threat from clearing and is considered abundant within the region, with the state-wide remnant extent greater than 10,000 ha.

# 6.4 COMMUNITY 4 – CLONCURRY BOX OPEN WOODLAND ON HILLS (RE 1.11.3X1)

### 6.4.1 Location

The Cloncurry Box Open Woodland on hills (RE 1.11.3x1) occurred within the valley of the Knapdale Range and along the eastern sections of the Project site (refer to Figure 7). This community covered approximately 9.7% (331.6 ha) of the entire site.

## 6.4.2 Community Description

This community consists of an open canopy of Cloncurry Box (*Eucalyptus leucophylla*), with associated Western Bloodwood (*Corymbia terminalis*) (Photo Plate 5). Ground cover consisted of 30% bare ground, 20% rock, 10% leaf litter and 35% tussock grass. Trees and shrubs cover approximately 5%, with an average crown cover of 8%. The average number of flora species identified along a Secondary transect within this community is 8 in the dry season and 29 in the wet season.



Photo Plate 5 Cloncurry Box Open Woodland on hills – RE 1.11.3x1



Species presented within Table 9 are indicative of the dominant species recorded within this community. A full list of species is presented in Appendix B. This RE is located along the Corella Formation geological sequence, with associated calcareous siltstone, limestone and minor metabasalts at the top.

Table 9 Community 4 (RE 1.11.3x1) – Vegetation Community Description

Community	Cloncurry Box Open Woodland on hills
Regional Ecosystem	RE 1.11.3x1: Low open-woodland of <i>Eucalyptus leucophylla</i> often with <i>Corymbia terminalis</i> and Eucalyptus <i>leucophloia</i> with <i>Acacia spp.</i> dominated shrub layer and ground layer of <i>Triodia spp.</i> and/or tussock grasses. Includes areas of <i>Acacia spp.</i> shrubland and <i>Triodia spp. grassland.</i> Occurs on hills on strongly folded pre-Cambrian rocks; skeletal soils, some shallow loams. (BVG1M: 19b)
Biodiversity Status	No concern at present
VMR Status	Least concern
EPBC Act	Not listed
Tree Layer	5 – 7 metres <u>Eucalyptus leucophylla</u> , Corymbia terminalis, Eucalyptus leucophloia
Shrub Layer	0.5 – 2.5 metres <u>Acacia chisholmii, Acacia monitcola,</u> Acacia lysiphloia, Grevillea striata, Carissa lanceolata, Acacia torulosa
Groundcover	0 – 0.5 metre <u>Triodia pungens</u> , Enneapogon polyphyllus Aristida contorta, Fimbristylis dichotoma, Fimbristylis microcarya, Crotalaria novae-hollandiae,
Structure Category	Very sparse

### 6.4.3 Conservation Status

## **6.4.3.1** Species

Targeted searches for species of conservation significance determined that no species of conservation significance inhabit the Cloncurry Box Open Woodland on hills (RE 1.11.3x1) during survey periods.

Non-native species identified within RE 1.11.3x1 include the Kapok Bush (*Aerva javanica*), Cockroach Bush (*Senna notabilis*), Buffel Grass (*Pennisetum ciliare*), Cloncurry Buffel (*Pennisetum pennisetiforme*) and Flannel Weed (*Sida cordifolia*). No weed species, listed under the LP Act or listed as of national significance, were observed within RE 1.11.3x1.



#### 6.4.3.2 Community

As detailed in Table 7, Cloncurry Box Open Woodland (RE 1.11.3x1) is listed as 'Least Concern' under the VMR, 'No Concern at Present' under the DERM Biodiversity Status and is not listed under the EPBC Act.

Although RE 1.11.3 is not protected within the Northwest Highlands bioregion, intact stands are abundant throughout this Queensland bioregion. The Cloncurry Box Open Woodland on low broad hills (RE 1.11.3e) is not under current threat from clearing or non-native species encroachment. RE 1.11.3 is considered abundant within the region, with the state-wide remnant extent greater than 10,000 ha.

# 6.5 COMMUNITY 5 - MIXED BLOODWOOD RIPARIAN WOODLAND (RE 1.3.6B)

#### 6.5.1 Location

The Mixed Bloodwood Riparian Woodland community occurred on all watercourses within the Project site (refer to Figure 7), covering approximately 0.3% (11.2 ha) of the entire site.

# 6.5.2 Community Description

This community is dominated by the Western Bloodwood (*Corymbia terminalis*) and North-west Ghost Gum (*Corymbia aparrerinjia*), with associated Cloncurry Box (*Eucalyptus leucophylla*) (Photo Plate 6). Ground cover consisted of 10% bare ground, 20% rock, 5% leaf litter and 55% groundcover. Trees and shrubs cover approximately 10%, with an average crown cover of 24%. The average number of flora species identified along a Secondary transect within this community is 11 in the dry season and 41 in the wet season.



Photo Plate 6 Mixed Bloodwood Riparian Woodland – RE 1.3.6b



Species presented within Table 10 are indicative of the dominant species recorded within this community. A full list of species is presented in Appendix B. This community occurs along the Corella formation geological sequence. It occurs on terraces and floodplains on Quaternary alluviums. Soils consist of rock, gravel and shallow loams.

Table 10 Community 5 (RE 1.3.6b) – Vegetation Community Description

Community	Mixed Bloodwood Riparian Woodland
Regional Ecosystem	RE 1.3.6b: Floodplain (other than floodplain wetlands). Woodland of Corymbia aparrerinja often with Corymbia terminalis, Eucalyptus leucophylla, Eucalyptus camaldulensis, Lysiphyllum cunninghamii and/or Acacia cambagei with a sparse ground layer of tussock grasses with Triodia longiceps in some places. Occurs on river terraces. (BVG1M: 16c)
Biodiversity Status	Of Concern
VMR Status	Least concern
EPBC Act	Not listed
Tree Layer	Corymbia terminalis, Corymbia aparrerinjia, Eucalyptus leucophylla, Eucalyptus camaldulensis
Shrub Layer	1 – 3 metres <u>Acacia holosericea, Acacia monticola, Acacia retivena, Sesbania javanicea, Ocimum tenuiflorum</u>
Groundcover	0 – 0.7 metre <u>Pennisetum ciliare, Indigofera colutea,</u> Heteropogon contortus, Eragrostis elongata, Eragrostis basedowii, Themeda triandra, Cyperus difformis, Cyperus pulchellus, Fimbristylis microcarya, Alternanthera denticulata, Bonamia media, Crotalaria novae-hollindiae, Evolvulus alsinoides, Vigna radiate var sublobata
Structure Category	Very sparse

## 6.5.3 Conservation Status

# **6.5.3.1** Species

Targeted searches for species of conservation significance determined that no species of conservation significance inhabit the Mixed Bloodwood Riparian Woodland (RE 1.3.6b) at the time of surveys.

No weed species, listed as a weed of national significance or listed under the LP Act, were observed within Mixed Bloodwood Riparian Woodland (RE 1.3.6b). However non-native species which inhabit this community include Mimosa (*Acacia farnesiana*), Kapok Bush (*Aerva javanica*), Khaki Weed (*Alternanthera pungens*), Spiked Malvastrum (*Malvastrum americanum var americanum*), Buffel



Grass (*Pennisetum ciliare*), Cloncurry Buffel (*Pennisetum pennisetiforme*), Cockroach Bush (*Senna notabilis*) and Flannel Weed (*Sida cordifolia*).

## 6.5.3.2 Community

As detailed in Table 10, Mixed Bloodwood Riparian Woodland (RE 1.3.6b) has been given an 'Of Concern' DERM Biodiversity status due to a high grazing pressure, changed fire regimes and subjection to Buffel Grass (*Pennisetum ciliare*) invasion. It is listed as being 'Least Concern' under the VMR and is not classed as a threatened ecological community under the EPBC Act. Areas within the Northwest Highlands bioregion where RE 1.3.6 is protected include the Boodjamulla (Lawn Hill) National Park, Lawn Hill (Gregory) Resources Reserve, Camooweal Caves National Park and Lawn Hill (Gregory River Base) Resources Reserve.

Overall, the condition of Mixed Bloodwood Riparian Woodland on the Project site is healthy, with a relatively diversity of species comprising the community. Intact stands of this community are abundant within this Queensland bioregion, with the total regional mapped extent of this RE compromising of greater than 10,000 ha. Assuming mitigation strategies are in place, it is unlikely the Project will have impact on the regional extent and health of this community.

# 6.6 COMMUNITY 6 – RIVER RED GUM RIPARIAN WOODLAND (RE 1.3.7B)

#### 6.6.1 Location

The River Red Gum Riparian Woodland (RE 1.3.7b) fringes most watercourses on the Project site. This community comprises 2.9% (98.4 ha) of the Project site (refer to Figure 7).

# 6.6.2 Community Description

The River Red Gum Riparian Woodland (RE 1.3.7b) is dominated by the River Red Gum (*Eucalyptus camaldulensis*), with associated Northern Swamp Box (*Lophostomon grandiflorus subsp. riaparius*), and North-west Ghost Gum (*Corymbia aparrerinjia*) (Photo Plate 7 and Photo Plate 8). Unlike the RE description for 1.3.7b, no *Melaleuca spp.* are established within this community on the Project site. Larger watercourses with more frequent surface water inundation, such as the Dugald River, contained *Melaleuca spp.*. A shrubby understory was present. Groundcover averages 60% grasses and vines, 20% leaf litter and 10% gravel and sand. Trees and shrubs comprise 10% of the community coverage, with approximate canopy coverage of 19%. The average number of species recorded in a Secondary transect is 12 during the dry season and 50 during the wet season.

