

- .
- .
- .
- .
- .
- .
- .

5 ddYbX]l '5 ''

<UV]Hha Udd]b['XYgW]dh]cbg'fBcf\ Yfb`HYff]hcfntL

Á

Á

<UV]HJha Udd]b['XYgW]d]h]cbg' E' BcfH Yfb'HYff]hcfm (based on DLRM Land Type mapping)'

@bXgWUdY'WUgg. Alluvial Floodplains'

@bXZ:fa 'i b]h Drainage system'

@bX'HndYfY[]cb. 'Barkly Clay Plains'



8 YgW]d]h]cb /
cVgYf j U]h]cbg.

- Also referred to as 'Riparian Area' in terms of consideration of sensitive vegetation types within the Northern Territory.
- Uncommon with Project footprint and occurs only within Barkly Clay Plains land type region (i.e. Mitchell Grass Plains) and is not intersected within the Tennant Creek Sandplains land type region.
- The main drainage systems traversed are Ranken River, Georgina River, James River and Blue Bush Creek, plus some major tributaries with defined channels.
- Drainages often contain a main drainage channel with additional smaller (braided) channels and associated floodplains.
- Become flooded for short periods; some areas pool for extended periods after flooding.
- Floodouts adjacent to drainage systems are described as a different landform class – Alluvial Plains.
- Weed infestations (such as Noogoora Burr) were observed on banks of some drainages.

Gc] 'hmdYg.'

Vertosols; sandy, silty and clay soils on Quaternary alluvium

J Y[YH]h]cb
hmdYf]k.

Land Type geor3: Low Open Woodland – Mixed species low woodland over tussock grasses. Dominant species include *Eucalyptus microtheca*, *Acacia stenophylla*.
No other vegetation types described within DLRM dataset

<UV]Uha Udd]b['XYgW]dh]cbg' E' Bcfh Yfb 'HYff]hcfm (based on DLRM Land Type mapping)

@bXgWUdY'WUgg. Alluvial Floodplains'

@bXZ:fa 'i b]h Alluvial Plains'

@bX'HndYfY[]cb. 'Tennant Creek Sandplains'



8 YgW]dh]cb /
cVgYfj U]h]cbg.

- Land Type amma2 was the best descriptor of alluvial plains traversed by the Project footprint.
- *Corymbia aparrerinja* was also present in the upper canopy in low densities.
- Uncommon within the Project footprint and are confined to west on Tennant Creek Station and Phillip Creek Station.
- High cattle presence was observed; grasses were heavily grazed.

Gc] 'hndYg.'

Kandosols; sandy, silty and clay soils on Quaternary alluvium'

JY[YhU]cb'
hndYf]t.'

Land Type = amma2: Low Open Woodland – mixed species low open woodland over tussock grassland. Dominant species – *Eucalyptus microtheca*, *Acacia aneura* and *Acacia georginae*.

Land Type = amma1: Tussock Grassland – mixed species tussock grassland with low isolated trees. Dominant species – *Fimbristylis dichotoma*, *Enneapogon polyphyllus* and *Eragrostis xerophila*.

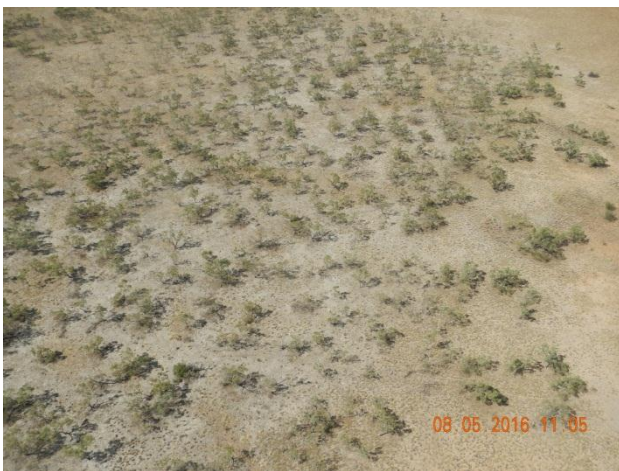
Land Type = amma1b: Low Open Woodland – mixed species low open woodland over tussock grassland. Dominant species – *Eucalyptus microtheca*, *Atalaya hemiglauca* and *Acacia estrophiolata*.

<UV]Uha Udd]b['XYgW]dl]cbg' Ē' Bcfh Yfb 'HYff]jcfm (based on DLRM Land Type mapping)

@bXgWUdY'WUgg. Alluvial Floodplains

@bXZ:fa 'i b]h Alluvial Plains

@bX'HndY'fY[]cb. 'Barkly Clay Plains'



8 YgW]dl]cb' /
cVgYf j U]cbg.

- Mainly associated with floodout areas of major watercourses; however also include tributaries and drainages without distinct drainage channel.
- Floodouts and depressions may support an upper canopy of *Eucalyptus microtheca*, *Excoecaria parvifolia*, *Acacia stenophylla*, or *Acacia georginae*.
- Tributaries only supported a shrub layer (no dominant trees)
- Weeds infestation likely to be present, such as Mesquite and Prickly Acacia.
- High cattle presence was observed; grasses were heavily grazed.

Gc] 'imdYg.'

Vertosols; sandy, silty and clay soils on Quaternary alluvium

JY[YfU]cb'
imdYfbk.

Land Type = dry1: Low Open Woodland – Eucalypt low open woodland over tussock grasses. Dominant species – *Eucalyptus microtheca*, *Eucalyptus coolabah*, *Excoecaria parvifolia*.

Land Type = dry1b: Tussock grassland – *Astrebla* tussock grassland. Dominant species – *Astrebla pectinata*, *Eulalia aurea*, *Aristida latifolia*.

Land type = geor1: Tussock grassland – *Astrebla* tussock grassland. Dominant species – *Astrebla pectinata*, *Astrebla elymoides*, *Chenopodium auricomum*.

Land Type = joan1: Low Open Woodland – Mixed species low open woodland over tussock grasses. Dominant species – *Eucalyptus microtheca*, *Excoecaria parvifolia*, *Bauhinia cunninghamii*.

Land Type = joan2: Low Open Woodland – Eucalypt low open woodland over tussock grasses. Dominant species – *Eucalyptus microtheca*, *Excoecaria parvifolia*.

Land Type = joan4: Low Open Woodland – Mixed species low open woodland over tussock grasses. Dominant species – *Eucalyptus microtheca*, *Excoecaria parvifolia*, *Acacia stenophylla*.

<UV]HJha Udd]b['XYgW]d]h]cbg' Ē' Bcfh Yfb 'HYff]hcfm (based on DLRM Land Type mapping)

@bXgWUdY'WUgg. Desert Sandplains

@bXZ:fa 'i b]h Plains

@bX'HndYfY[]cb. 'Tennant Creek Sandplains'



8 YgW]d]h]cb /
cVgYfj U]h]cbg.

- Uncommon within the construction footprint.
- Three sections were identified – totalling 13.1 km, all west of the Stuart Highway on Phillip Creek Station.
- A reasonably high cattle impact was observed within these areas; tussock grasses were heavily grazed.
- This are the only areas were patches of *Acacia aneura* were observed along the NT section of the construction footprint.

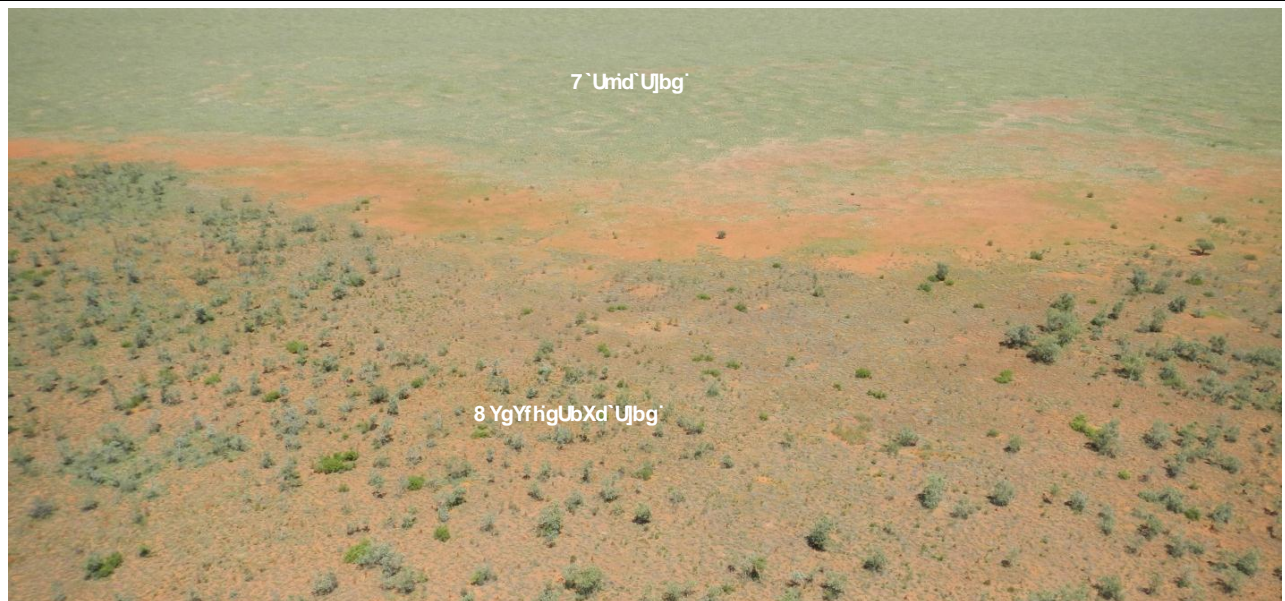
Gc] 'hndYg.

Kandosols; red sands; higher loam and clay content in soils compared to sandplains.

JY[YhU]cb
hndYfgL.

Land Type = bushy: Tussock Grassland – mixed species tussock grassland with scattered shrubs of *Acacia aneura*. Dominant species – *Acacia aneura*, *Aristida contorta*, *Enneapogon polyphyllus* and *Triodia pungens*

@bX'HndYfY[]cb. 'Barkly Clay Plains'



8 YgW]d]h]cb /
cVgYfj U]h]cbg.

- Small 'islands' within clay plains that are not often intersected by Project footprint.
- No ground-survey occurred during field studies.

Gc] 'hndYg.

Tenosols; red sands

JY[YhU]cb
hndYfgL.

Land Type = camil1: Hummock grassland – *Triodia hummock* grassland +/- shrubs. Dominant species – *Triodia pungens*, *Triodia schinzii*, *Eragrostis eriopoda*.

<UV]Uha Udd]b['XYgW]dh]cbg' E' Bcfh Yfb 'HYff]hcfm (based on DLRM Land Type mapping)

@bXgWUdY'WUgg. Desert Sandplains

@bXZ:fa 'i b]h' Sandplains

@bX'HndY'fY[]cb. Tennant Creek Sandplains'



8 YgW]dh]cb /
cVgYfj U]h]cbg.

- Extensive area within the Project footprint; only intersected within the Tennant Creek Sandplains.
- *Eucalyptus setosa* and *Acacia lysiphloia* were identified consistently across the Project footprint.
- *Eucalyptus gamophylla* tended to occur when soils has a higher loam/clay sub-layer.
- Very similar to the 'plains' landform unit within 'lateritic plains and rises'; however, there is a distinct lack of depressions/drainages and associated low rocky rises in the desert sandplains.
- Low to no cattle presence was observed.
- Experienced large fires at a moderately high frequency for the region (2 to 3 fires within 12 years).

Gc] 'hndYg.'

Tenosols; red sands

JY[Y]U]h]cb'
hndYf]g.

Land Type = sing: Tussock Grassland – Acacia/Eucalypt open woodland over hummock grassland.
Dominant species – *Acacia sericophylla*, *Corymbia opaca* and *Eucalyptus gamophylla*.

<UVJHha Udd]b['XYgW]dHjcbg' E' BcfH Yfb 'HYff]jcfm (based on DLRM Land Type mapping)

@bXgWUdY'WUgg. Lateritic Plains and Rises

@bXZ:fa 'i b]h'Plains

@bX'HndYfY[]cb. Tennant Creek Sandplains'



8 YgW]dHjcb /
cVgYfj UHjcbg.

- Extensive area within the Project footprint; only intersected within the Tennant Creek Sandplains.
- Land Type 'elli1' best describes vegetation traversed by the Project footprint; however, hummock grasses (*Triodia* sp.) were dominant. Land Types 'aligna' and 'pren2' not observed during surveys.
- Similar to the 'sandplains' landform unit within 'desert sandplains'; however often only located when rocky rises were present in the region. Lateritic plains also have fairly regular depressions / temporary swamps compared to desert sandplains.
- *Eucalyptus gamophylla* became more common within the eastern area of lateritic plains.
- Low to no cattle impact was observed.
- Experienced large fires at a moderately high frequency for the region (2 to 3 fires in some areas within 12 years).

Gc]'hndYg.'

Kandosols (soils which lack strong texture contrast, have massive or only weakly structured B horizons, and are not calcareous throughout); red sandy and earth soils

JY[YfU]cb'
hndYfjL'

Land Type = elli1: Low open woodland – *Corymbia* spp. low open woodland over mixed tussock and hummock grassland. Dominant species – *Corymbia setosa*, *Corymbia aparrerinja*, *Corymbia opaca*.

Land Type = aligna: Tall sparse shrubland – *Acacia* spp. tall sparse shrubland over mixed tussock and hummock grassland. Dominant species – *Acacia aneura*, *Acacia georginae*.

Land Type = pren2: Low open woodland – *Corymbia* spp. low open woodland over tussock grassland. Dominant species – *Corymbia terminalis*, *Atalaya hemiglaucua*, *Corymbia aparrerinja*.

C

<UV]HJha Udd]b['XYgW]d]h]cbg' E' BcfH Yfb 'HYff]hcfm (based on DLRM Land Type mapping)

@bXgWUdY. Lateritic plains and rises

@bXZ:fa 'i b]h' Low rises

@bX'HndYfY[]cb. Tennant Creek Sandplains'



8 YgW]d]h]cb /
cVgYf j U]cbg.

- Land Type 'pren3' best describes vegetation traversed by the Project footprint. Areas similar to Land Type 'elli2' were observed in small area; however, only included *Corymbia aparrerinja* (not *Acacia aneura* or *Corymbia dichromophloia*)
- *Acacia hilliana* was commonly observed as a co-dominant species within Land Type 'pren3'. *Eucalyptus leucophloia* (low open woodland) was observed in some rises in the western region of the Project footprint.
- Extensive area within the Project footprint.
- Note that the total area mapped for this habitat type is exaggerated due to scale of mapping. It indicates a higher concentration of low rocky rises rather than the total area of low rocky rise. In general, rock rises were small and surrounded by lateritic (sandy) plains.
- Low to no cattle impact was observed.
- The area has experienced large fires at a moderately high frequency for the region (2 to 3 fires in some areas within 12 years).
- Low rises became slightly more elevated to the east; and were also associated with calcrete/limestone outcropping with a variety of different gravels.

Gc] 'hndYg.'

Rudosols; red soils with high gravel content

J Y[YH]h]cb
hndYf]k.

Land Type = pren3: Mid closed shrubland – *Acacia lysiphloia* closed shrubland over tussock grassland. Dominant species – *Acacia lysiphloia*, *Corymbia terminalis*, *Atalaya hemiglauca*.

Land Type = elli2: Woodland or Open woodland or Tall sparse Shrubland – Eucalypt/Acacia open woodland over hummock grassland. Dominant species – *Corymbia aparrerinja*, *Acacia aneura*, *Corymbia dichromophloia*.

<UV]HJha Udd]b['XYgW]dl]cbg' E' BcfH Yfb'HYff]jcfm (based on DLRM Land Type mapping)

@bXgWUdY. Lateritic plains and rises

@bXZ:fa 'i b]h' Playas

@bX' HndY'fY[]cb. Tennant Creek Sandplains'



8 YgW]dl]cb /
cVgYfj U]cbg.

- No playas are crossed by the Project footprint; however, some playas are close (i.e. within 500 m of Project footprint) and are therefore included in habitat description as these areas are considered as important refuge habitat types for the region (at least) and may support threatened species (such as Latz's Grass, *Sporobolus latzii*).
- Low to no cattle impact was observed.
- Experienced large fires at a moderately high frequency for the region (2 to 3 fires in some areas within 12 years).
- The DLRM dataset used for habitat descriptions included playas within the 'Desert Sandplains' landscape class; however, observations within the Project footprint better placed playas within 'Lateritic Plains and Rises' due to more consistent observations. Nonetheless, playas are described the same whether they are within either landscape class 'Desert Sandplains' or 'Lateritic Plains and Rises'.
- No weeds were observed in playas landed during surveys.

Gc] 'imdYg.'

Vertosols; clay soils; heavy loams

JY[YfU]cb
imdYf]k.

Land Type = playa: Tussock grassland – Mixed species tussock grassland with isolated *Eucalyptus microtheca* or *Eucalyptus victrix*. Dominant species – *Eragrostis australasica*, *Eucalyptus microtheca* or *Eucalyptus victrix*.

<UVJHha Udd]b['XYgW]dl]cbg' Ē BcfH Yfb'HYff]jcfm(based on DLRM Land Type mapping)'

@bXgVUdY. Sandstone plains and rises

@bXZ:fa 'i b]h' Rises

@bX'HndYfY[]cb. Tennant Creek Sandplains'



8 YgW]dl]cb' /
cVgYfj U]cbg.

- Small area within the Project footprint
- Only intersected within the western region of the Tennant Creek Sandplains.
- No ground-survey occurred during field studies.

Gc]' hndYg.'

Rudosols

JY[YhU]cb'
hndYf]t.

Land Type = cherry 1a: Hummock grassland – *Triodia pungens* hummock grassland with low isolated trees and shrubs. Dominant species – *Triodia pungens*. (LT = cherry1a)

Land Type = tenck1: Hummock grassland – hummock grassland with isolated trees of *Corymbia aparrerinja* and other species. Dominant species – *Triodia pungens*. (LT = tenck1)

Land Type = cherry1b: Tussock grassland (sparse) – Mixed species sparse tussock grassland (or low open woodland) with low isolated trees/shrubs of *Acacia aneura* and *A. georginae*. (LT = cherry1b)

<UV]Hha Udd]b['XYgW]dh]cbg'Ē'BcfH Yfb'HYff]rcfm(based on DLRM Land Type mapping)'

@bXgWUdY. Clay plains

@bXZfa 'i b]h'Plains

@bX'HndYfY[]cb. Barkly Clay Plains'



8 YgW]dh]cb/ ' cVgYfj U]cbg.'

- Extensive area within the Project footprint
- Only intersected within the Barkly Clay Plains.
- Generally similar to other landform unit 'Downs Plains'; however, 'Plains' shows less variation in microtopography and floristic variation.
- Rarely supported trees.
- Some areas contained surface rocks, cracks, and had evidence of minor sinkholes.
- High presence of cattle.
- No observation of weed infestations.

Gc]'imdYg.'

Vertosols; black soil plains; cracking clay soils; heavy grey clays

JY[YH]cb' hndYfbk.'

Land Type = wond: Tussock grassland – *Astrebla* tussock grassland. Dominant species – *Astrebla pectinata*

<UVJHha Uddjb['XYgW]dhjcbg' E' Bcfh Yfb 'HYff]hcfm (based on DLRM Land Type mapping)'

@bXgWUdY. Clay plains

@bXZ:fa 'i b]h' Downs Plains

@bX' HndY'fY[]cb. Barkly Clay Plains'



8 YgW]dhjcb' /
cVgYfj U]hcbg.'

- Extensive area within the Project footprint
- Only intersected within the Barkly Clay Plains.
- Generally similar to other landform unit 'Plains'; however, 'Downs Plains' shows more variation in microtopography and floristic variation, and increased areas of surface rock/gravel.
- Only supports trees in minor depressions (not encountered within Project footprint)
- Some areas contained surface rocks, cracks, and had evidence of minor sinkholes.
- High presence of cattle.
- No observation of weed infestations.

Gc]' hndYg.'

Vertosols; black soil plains; cracking clay soils

JY[YH]hcb'
hndYfgL'

Land Type = barklyA, barklyB: Tussock Grassland – *Astrelba tussock grassland*. Dominant species – *Astrelba pectinata*, *Aristida latifolia*, *Eulalia aurea*

Land Type = barklyC: Tussock Grassland – mixed species tussock grassland. Dominant species – *Aristida latifolia*, *Astrelba pectinata*, *Brachyachne convergens*

Land Type = cres2: Tussock Grassland – mixed species tussock grassland. Dominant species – *Aristida latifolia*, *Eulalia aurea*, *Dichanthium fecundum*

Land Type gidgee: Low Woodland – *Acacia low woodland over tussock grasses*. Dominant species – *Acacia cambagei*, *Acacia georginae*

< UJ]Uha Udd]b['XYgW]dl]cbg' E' Bcfh Yfb'HYff]hcfm (based on DLRM Land Type mapping)

@bXgWUdY. Clay plains

@bXZ:fa 'i b]h' Inland Wetlands

@bX' HndYfY]]cb. Barkly Clay Plains'



8 YgW]dl]cb/ ' :
cVgYfj U]cbg. '

- Small area intersected by the Project footprint.
- The ROW intersects a temporary depression swamp that supports *Eucalyptus microtheca*, not considered to be of significance.
- One access track intersects the edge of one area described as an Inland Wetland (it should be noted that this access track already exists and will require 5 m widening to allow access for construction operations).
- These areas are considered important for biodiversity; however no wetlands of regional, state, or national significance occur within the vicinity of the Project footprint.
- High presence of cattle; however unknown impact as no ground-survey was conducted during field studies.

Gc] 'hndYg. '

Vertosols; black soil plains; cracking clay soils

JY] YhU]cb'
hndYfgL. '

Land Type = syl1, syl3: Chenopod Open Shrubland – Chenopod open shrubland. Dominant species – *Chenopodium auricomum*, *Muehlenbeckia florulenta*.

Land Type = syl2: Low Woodland – Eucalypt low woodland over tussock grasses. Dominant species – *Eucalyptus microtheca*, *Eucalyptus coolabah*, *Acacia stenophylla*.

- .
- .
- .
- .
- .
- .
- .

5 ddYbX]l '6 ''
<UV]hUha Udd]b['XYgW]dh]cbg'fE i YYbg`UbXL'

Á Á Á

<UV]Hha Udd]b['XYgW]d]c]bg'ĒE i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY' . Alluvial river and creek flats

Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave built lunettes. Excludes colluvial deposits such as talus slopes and pediments.



Photographs taken during field studies

Gc]`hmdYg.`

Includes a diverse range of soils, predominantly Vertosols and Sodosols; also with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols

Mt Isa Inlier bioregion

%`" . *Corymbia aparrerinja*, *Corymbia terminalis* open woodland on sandy terraces (RE polygons indicate - 1.3.6a, 1.3.6x1c).

%`+ . *Eucalyptus camaldulensis* woodland on channels and levees (RE polygons indicate - 1.3.7b)

Mitchell Grass Downs bioregion

("`% *Eucalyptus camaldulensis* +/- *Melaleuca* spp. woodland on drainage lines (RE polygons indicate - 4.3.1).

("`" . *Eucalyptus coolabah*, *E. camaldulensis* +/- *Lysiphyllum gilvum* open woodland on drainage lines (RE polygons indicate - 4.3.3).

("`%\$. *Corymbia terminalis* +/- *Lysiphyllum gilvum* and *Acacia victoriae* low open woodland on alluvium (RE polygons indicate - 4.3.10).

("`%& . *Chenopodium auricomum* +/- *Muehlenbeckia florulenta* open shrubland on swamps (RE polygons indicate - 4.3.12).

("`% . *Astrebla elymoides* +/- *A. squarrosa* +/- *Aristida latifolia* grassland on alluvium (RE polygons indicate - 4.3.16).

("`%+ . *Astrebla pectinata* +/- *Astrebla* spp. +/- *Aristida latifolia* grassland on alluvium (RE polygons indicate - 4.3.17).

("`% . *Dichanthium* spp., *Eulalia aurea*, *Astrebla* spp. grassland on alluvium (RE polygons indicate - 4.3.19).

FY]]cbU`
Yw`gnghYa`
j Y] YrU]cb`
hmdYf]t`

(note only RE1 & RE2 descriptions are referenced)

7ca a Ybh`

- The Project footprint intersects rivers, creeks, tributaries, and associated floodout areas of those drainage systems.
- All drainages are ephemeral and no permanent pools were observed.
- May support EPBC, NT, & Qld threatened species – Painted Honeyeater (*Grantiella picta*)
- May support Qld threatened species – Yellow Chat (Gulf) (*Epthianura crocea crocea*)

<UV]HJha Udd]b['XYgW]d]h]cbg'Ē'E i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY' (. Clay plains

Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. Excludes clay plains formed in-situ on bedrock.



Photographs taken during field studies

GcJ' hmdYg.'

Mainly Vertosols with gilgai microrelief, but includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.

Mt Isa Inlier bioregion

(' "% *Astrebla pectinata* +/- *Aristida latifolia* +/- *Eulalia aurea* grassland on Tertiary sediments overlying limestone (RE polygons indicate 4.4.1)

Mitchell Grass Downs bioregion

(' "% *Astrebla pectinata* +/- *Aristida latifolia* +/- *Eulalia aurea* grassland on Tertiary sediments overlying limestone (RE polygons indicate 4.4.1, 4.4.1a, and 4.4.1c)

(" "% *Astrebla elymoides* +/- *A. squarrosa* +/- *Aristida latifolia* grassland on alluvium (RE polygons indicate 4.3.16)

(" "% *Astrebla pectinata* +/- *Astrebla* spp. +/- *Aristida latifolia* grassland on alluvium (RE polygons indicate 4.3.17)

FY[jcbU'
Yw' gngHYa '
j Y[YH]cb'
hmdYfgL'

(note only RE1 & RE2 descriptions are referenced)

7 ca a Ybh'

- Majority within Mitchell Grass Downs (226 ha).
- Most extensive vegetation type traversed by project footprint is RE 4.4.1.
- Some clay plains contained minor depressions but the majority were flat to gently undulating plains.
- May support EPBC threatened species - Plains Death Adder (*Acanthophis hawkei*).

<UV]Hha Udd]b['XYgW]d]h]cbg'Ē'E i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY' . Old loamy and sandy plains

Tertiary-early Quaternary extensive, uniform near level or gently undulating plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes recent Quaternary alluvial systems, exposed duricrust, and soils derived from underlying bedrock.



Photographs taken during field studies

Gc]`hmdYg.`

Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.

Mt Isa Inlier bioregion

%)" . *Eucalyptus leucophloia* low open woodland on red earths on plateaus (RE polygons indicate - 1.5.3)

%) "(. *Eucalyptus leucophylla* low open woodland on red earths in valleys (RE polygons indicate - 1.5.4x1a)

%) "* . *Atalaya hemiglauca*, *Ventilago viminalis*, *Grevillea striata* low open woodland on red earth plains (RE polygons indicate - 1.5.6; 1.5.6a; 1.5.6x2)

%) "+ . *Corymbia terminalis* and/or *Acacia aneura* low open woodland on sandy red earth plains (RE polygons indicate - 1.5.7; 1.5.7a)

%) "%" . *Corymbia terminalis* low open woodland on basic metamorphics (RE polygons indicate - 1.11.3x1b)

%) "* . *Corymbia aparrerinja*, *Corymbia terminalis* open woodland on sandy terraces (RE polygons indicate - 1.3.6a)

Mitchell Grass Downs bioregion

%) "* . *Atalaya hemiglauca*, *Ventilago viminalis*, *Grevillea striata* low open woodland on red earth plains (RE polygons indicate - 1.5.6; 1.5.6x2)

%) "+ . *Corymbia terminalis* and/or *Acacia aneura* low open woodland on sandy red earth plains (RE polygons indicate - 1.5.7; 1.5.7a; 1.5.7x1)

%) "+ %" . *Eucalyptus leucophloia* low open woodland on skeletal soils on lateritic scarps and plateaus (RE polygons indicate - 1.7.1; 1.7.1c)

**FY]]cbU`
Yw`gnghYa`
j Y] YrU]cb`
hmdYfgL`**

(note only RE1 & RE2 descriptions are referenced)

7ca a Ybh`

- Relatively common within the footprint and occur in both bioregions intersected.
- Showed variation in vegetation assemblage but low variation in terms of landform.
- Not considered to support threatened species within the Project footprint.

<UV]HJha Udd]b['XYgW]d]h]cbg'Ē'E i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY+. Ironstone jump-ups

Cainozoic duricrusts formed on a variety of rock types, usually forming mesas or scarps. Includes exposed ferruginous, siliceous or mottled horizons and associated talus and colluvium, and remnants of these features, for example low stony rises on downs.



Photograph taken during field studies

GcJ' hmdYg.'

Soils are usually shallow Rudosols and Tenosols, with minor Sodosols and Chromosols on associated pediments, and shallow Kandosols on plateau margins and larger mesas.

FY] jcbU'
Yw'gnghYa'
j Y[YrU]cb'
hmdYfbt'

(note only RE1 & RE2 descriptions are referenced)

Mt Isa Inlier bioregion

%+%' *Eucalyptus leucophloia* low open woodland on skeletal soils on lateritic scarps and plateaus (RE polygons indicate - 1.7.1).

%) " : *Eucalyptus leucophloia* low open woodland on red earths on plateaus (RE polygons indicate - 1.5.3)

Mitchell Grass Downs bioregion

%+%' *Eucalyptus leucophloia* low open woodland on skeletal soils on lateritic scarps and plateaus (RE polygons indicate - 1.7.1; 1.7.1c).

%) "+. *Corymbia terminalis* and/or *Acacia aneura* low open woodland on sandy red earth plains (RE polygons indicate - 1.5.7)

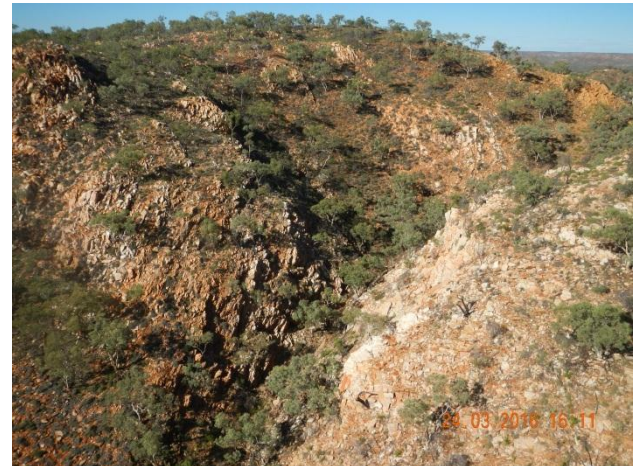
7ca a Ybh'

- Uncommon within Project footprint and mostly occurs in Mitchell Grass Downs bioregion.
- Only present as low stony rises within the Project footprint.
- No mesa or scarp structures are present.
- Not considered to support threatened species within the Project footprint.

<UV]HJha Udd]b['XYgW]d]h]cbg'Ē'E i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY'%% Hills and lowlands on metamorphic rocks

Metamorphosed rocks, forming ranges, hills and lowlands. Primarily lower Permian and older sedimentary formations which are generally moderately to strongly deformed. Includes low- to high-grade and contact metamorphics such as phyllites, slates, gneisses of indeterminate origin and serpentinite, and interbedded volcanics.



Photographs taken during field studies

Gc]`hmdYg.`

Soils are mainly shallow, gravelly Rudosols and Tenosols, with Sodosols and Chromosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.

**FY] jcbU`
YWtgnghYa`
j Y[YH]cb`
hmdYfbL`**

(note only RE1 & RE2 descriptions are referenced)

Mt Isa Inlier bioregion

%%%&` *Eucalyptus leucophloia* low open woodland (RE polygons indicate - 1.11.2a, 1.11.2b, 1.11.2x1).

%%%` *Corymbia terminalis* low open woodland on basic metamorphics (RE polygons indicate - 1.11.3a, 1.11.3b, 1.11.3x1; 1.11.3x1b)

%` *` *Corymbia aparrerinja*, *Corymbia terminalis* open woodland on sandy terraces (RE polygons indicate - 1.3.6x1a).

%` *` *Atalaya hemiglauca*, *Ventilago viminalis*, *Grevillea striata* low open woodland on red earth plains (RE polygons indicate - 1.5.6).

Mitchell Grass Downs bioregion

Not applicable

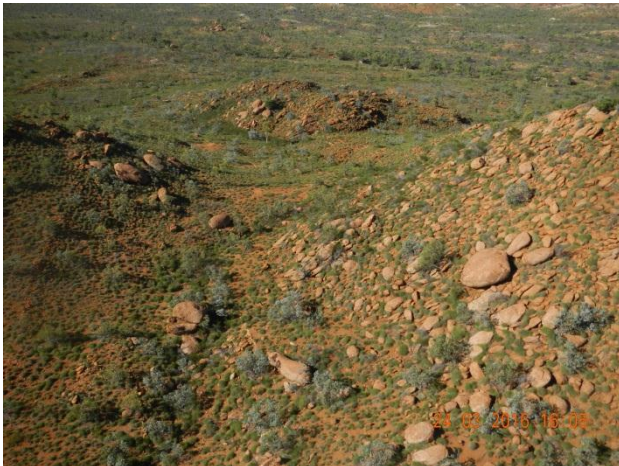
7ca a Ybh`

- Only intersected within Mt Isa Inlier bioregion.
- There were three main landform units observed within the Project footprint:
 - Rocky linear ridges and steep gullies, with outcrop and / or scree
 - Rounded rocky hills and shallow gullies, with or without outcrop
 - Lowlands in between hills and ridges, undulating to flat
- Rocky habitats within this land zone may support EPBC threatened species - Carpentarian Antechinus (*Pseudantechinus mimulus*).
- Rocky habitats within this land zone may support Qld threatened species - Northern Leaf-nosed Bat (*Hipposideros stenotis*), and Purple-necked Rock-wallaby (*Petrogale purpureicollis*).

<UV]HJha Udd]b['XYgW]d]h]cbg'Ē'E i YYbg'UbX' (based on regional ecosystem land zones)

@bX'ncbY%& Hills and lowlands on granitic rocks

Mesozoic to Proterozoic igneous rocks, forming ranges, hills and lowlands. Acid, intermediate and basic intrusive and volcanic rocks such as granites, granodiorites, gabbros, dolerites, andesites and rhyolites, as well as minor areas of associated interbedded sediments. Excludes serpentinites (land zone 11) and younger igneous rocks (land zone 8).



Photographs taken during field studies

Gc]`hmdYg.`

Soils are mainly Tenosols on steeper slopes with Chromosols and Sodosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.

FY[]cbU`

YWt gnghYa`

j Y[YH]cb`

hmdYfbL`

(note only RE1 & RE2 descriptions are referenced)

Mt Isa Inlier bioregion

%%&%` *Eucalyptus leucophloia* low open woodland on granites (RE polygons indicate - 1.12.1, 1.12.1x1)

%%&`& *Eucalyptus melanophloia* low open woodland on low hills and torfields on biotite granites (RE polygons indicate - 1.12.2; 1.12.2x1)

Mitchell Grass Downs bioregion

Not applicable

7 ca a Ybh`

- Only intersected within Mt Isa Inlier bioregion.
- There were three main landform units observed within the Project footprint:
 - Boulder piles
 - Hills with outcrop / boulders
 - Lowlands in between hills and boulder piles, undulating to flat
- Rocky habitats within this land zone may support EPBC threatened species - Carpentarian Antechinus (*Pseudantechinus mimulus*)
- Rocky habitats within this land zone may support Qld threatened species - Northern Leaf-nosed Bat (*Hipposideros stenotis*), and Purple-necked Rock-wallaby (*Petrogale purpureicollis*).

- .
- .
- .
- .
- .
- .
- .

5 ddYbXjI '7 ''

9 D6 7 'DfchWYX'A Uthfg'GYUfW 'Hcc`fYdcfhf' 'A Um&\$% £

Á

.

Á



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 09/05/16 15:15:21

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 50.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	14
Listed Migratory Species:	21

Other Matters Protected by the EPBC Act

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

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

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	7
Commonwealth Heritage Places:	None
Listed Marine Species:	28
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	27
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area
Erythrura gouldiae Gouldian Finch [413]	Endangered	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Petrogale lateralis MacDonnell Ranges race Warru, Black-footed Rock-wallaby (MacDonnell Ranges race) [66649]	Vulnerable	Species or species habitat may occur within area
Pseudantechinus mimulus Carpentarian Antechinus [59283]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Acanthophsis hawkei Plains Death Adder [83821]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Euseya lavarackorum Gulf Snapping Turtle [67197]	Endangered	Species or species habitat known to occur within area
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Commonwealth Land - Australian Government Solicitor Commonwealth Land - Department of Administrative Services Commonwealth Land - Department of Transport & Regional Development Defence - MT ISA TRAINING DEPOT Defence - NORFORCE DEPOT - TENNANT CREEK Defence - RSL Hall

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Reptiles		
Crocodylus johnstoni Freshwater Crocodile, Johnston's Crocodile, Johnston's River Crocodile [1773]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Ballara	QLD
John Flynn	NT
Tennant Creek Telegraph Station	NT

Invasive Species [[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]		Species or species habitat likely to occur within area

Reptiles

Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
---	--	--

Nationally Important Wetlands

Name	State	[Resource Information]
Austral Limestone Aggregation	QLD	
Lake Moondarra	QLD	

Caveat

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

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

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

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

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

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

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

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

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

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

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

Coordinates

-19.44822091 133.852283,-19.44855977 133.8545321,-19.4503931 133.8585977,-19.45643659 133.8960927,-19.45815278 133.9243363,-19.45724692 133.9408956,-19.46853348 134.000047,-19.46743058 134.0015851,-19.47056657 134.0142173,-19.47283655 134.0266194,-19.47523192 134.0473359,-19.47423283 134.0495712,-19.4915666 134.1057784,-19.4961162 134.1311467,-19.48897227 134.1427359,-19.4711135 134.3371582,-19.47290733 134.3939288,-19.47422269 134.4374149,-19.47697498 134.4600504,-19.47700134 134.5352912,-19.48523895 134.6713845,-20.28655052 137.1046338,-20.30551119 137.1563087,-20.36547976 137.3379768,-20.36525612 137.3510832,-20.38423243 137.4036859,-20.39614135 137.4312502,-20.40636758 137.4535085,-20.45971463 137.5789544,-20.45978445 137.5831031,-20.48626887 137.6629658,-20.53119373 137.7583474,-20.56985824 137.8692456,-20.57043359 137.8726622,-20.59798741 137.9398774,-20.64254988 138.0880125,-20.64775073 138.1254138,-20.65151619 138.1407643,-20.66237763 138.2000016,-20.67923579 138.3012646,-20.68706818 138.3386565,-20.70825419 138.4509219,-20.7157206 138.4748453,-20.7437725 138.6236255,-20.75039922 138.6959863,-20.75264015 138.7046632,-20.74647314 138.8891233,-20.78733639 139.0939929,-20.79599641 139.1842852,-20.79664282 139.1880269,-20.79729676 139.1897547,-20.82314387 139.2223573,-20.82460626 139.2264381,-20.82453037 139.239397,-20.8239825 139.2479854,-20.82383735 139.2622874,-20.82600762 139.2795607,-20.82554252 139.2869439,-20.8276396 139.2961915,-20.8278007 139.2983402,-20.82952139 139.300669,-20.82987076 139.3023982,-20.82994006 139.3053113,-20.83611415 139.3362119,-20.83537176 139.3379622,-20.8345009 139.3384087,-20.83402345 139.3390458,-20.83354358 139.3404013,-20.83219041 139.341644,-20.83165082 139.3426689,-20.83036586 139.3432905,-20.82481469 139.3500429,-20.82351565 139.3513301,-20.82005545 139.3533602,-20.8160612 139.3583895,-20.81422332 139.3591372,-20.81222445 139.3611604,-20.81085252 139.366448,-20.81127057 139.3680734,-20.812711 139.3697301,-20.81217882 139.3705754,-20.81150967 139.372629,-20.81174755 139.375209,-20.81116953 139.3767399,-20.81152835 139.3780109,-20.81231613 139.3788727,-20.81260662 139.3798646,-20.8135924 139.3810153,-20.81323979 139.3821632,-20.81274416 139.3849861,-20.81258739 139.3962064,-20.81207727 139.3978615,-20.81201398 139.3982712,-20.81179658 139.3988113,-20.81182642 139.3992809,-20.81258 139.403023,-20.81176731 139.405756,-20.81205175 139.4061593,-20.81205489 139.406638,-20.81116542 139.4091329,-20.81202662 139.4110218,-20.811727 139.4129556,-20.81092087 139.4153811,-20.80984433 139.4162362,-20.80890628 139.417524,-20.80858985 139.4192551,-20.80886587 139.4196592,-20.80892738 139.4203264,-20.80865924 139.4217855,-20.80888914 139.4221432,-20.80936696 139.4223436,-20.8097157 139.4228997,-20.81032238 139.4245474,-20.81124845 139.4277581,-20.81188699 139.4290229,-20.81670822 139.4353859,-20.81867656 139.4372462,-20.82024915 139.439776,-20.82321527 139.4405478,-20.82501412 139.4429295,-20.82511152 139.4467435,-20.82485406 139.4564783,-20.82529887 139.4568884,-20.82534024 139.4582005,-20.82433841 139.4586079,-20.82323037 139.4600373,-20.82263327 139.4601083,-20.82195912 139.4619941,-20.81999116 139.4614285,-20.81902184 139.461792,-20.8175544 139.4626415,-20.81708787 139.4617845,-20.81462694 139.4629754,-20.80599696 139.4620032,-20.80383272 139.4619581,-20.80214955 139.4621773,-20.80126092 139.4624428,-20.80055189 139.4629254,-20.79954615 139.4631065,-20.79903549 139.4633706,-20.7964872 139.463521,-20.79579481 139.4638662,-20.7953485 139.4634584,-20.79388788 139.4643866,-20.79344839 139.4668989,-20.79277242 139.4672599,-20.79155168 139.4681176,-20.79092015 139.4686223,-20.78455947 139.4767274,-20.78661265 139.478531

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

This page has been intentionally left blank

Appendix D
Northern Territory NRM INFONET threatened species report
.....(Northern Territory only) (8 June 2016)

This page has been intentionally left blank



Custom area

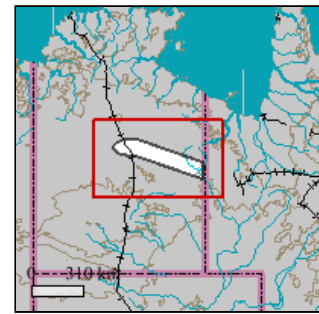
NT NRM Report



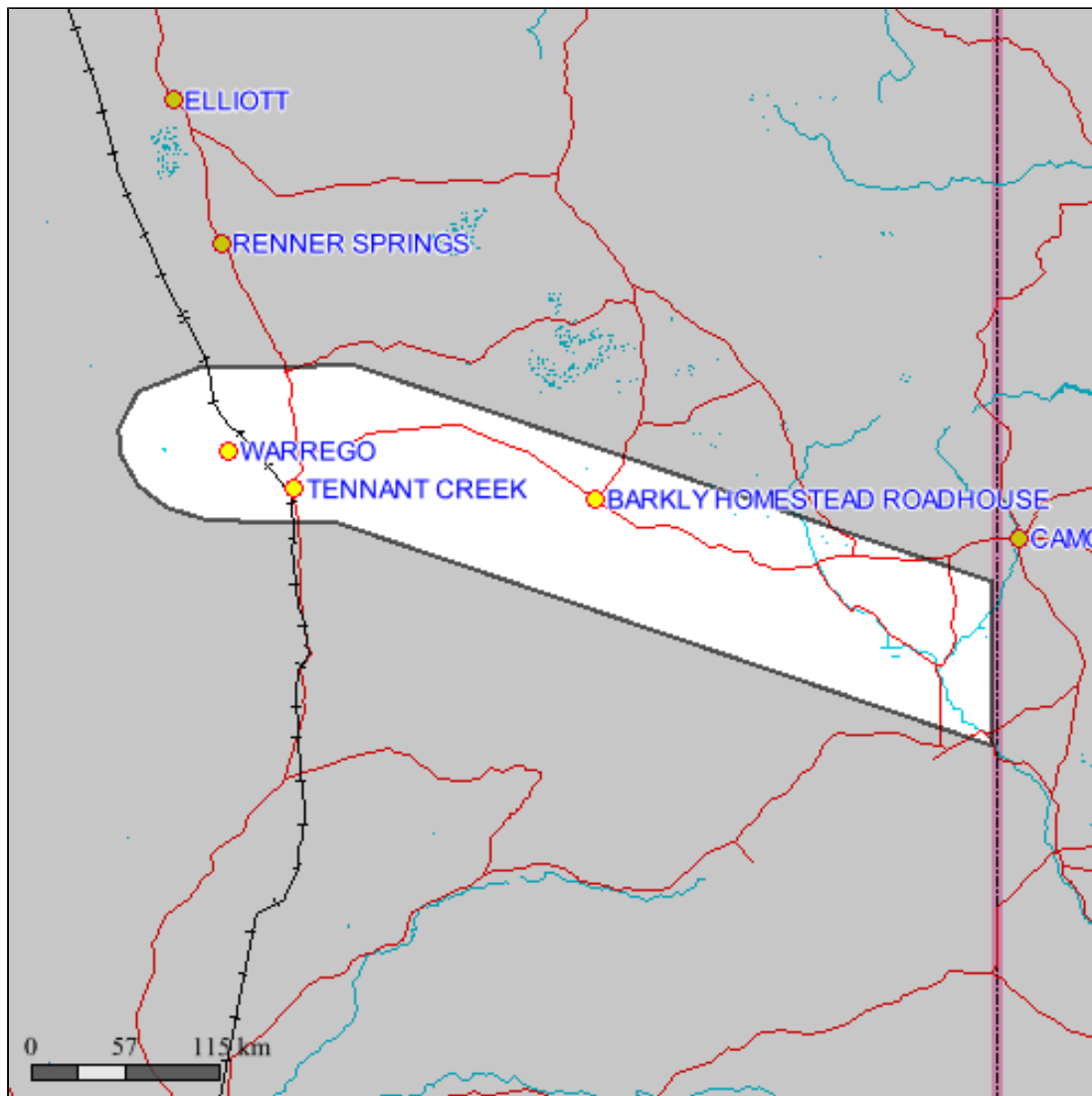
Custom area

Custom area encompasses an area of 46736.25 sq km extending from 18 deg 58.0 min to 21 deg 2.0 min S and 133 deg 14.0 min to 137 deg 58.0 min E.

Custom area is located in the Mitchell Grass Downs, Tanami, Davenport Murchison Ranges, bioregion(s)



Location of Custom area



Custom area Climate

The closest long-term weather station is WONARAH (19 deg 53.0 min S, 136.3358E) 77 km E of the center of selected area

Statistics

Mean max temp (deg C)
 Mean min temp (deg C)
 Average rainfall (mm)
 Average days of rain

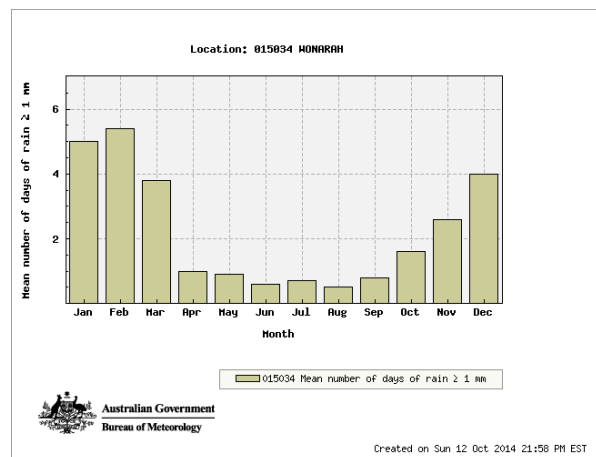
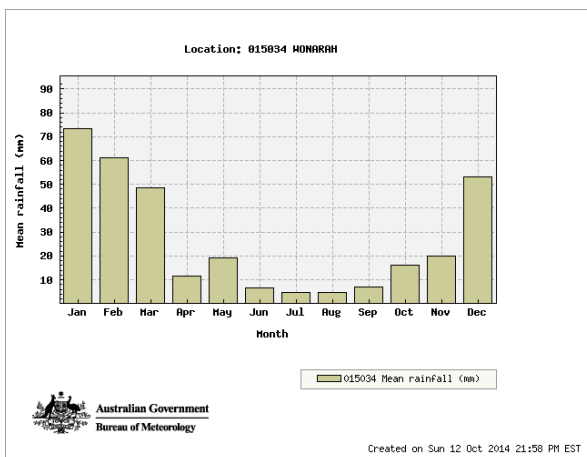
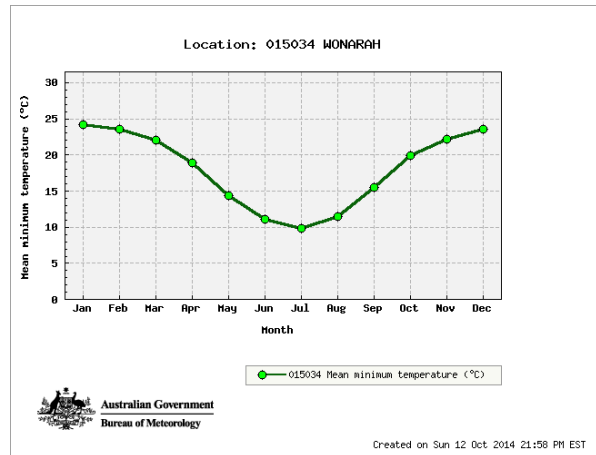
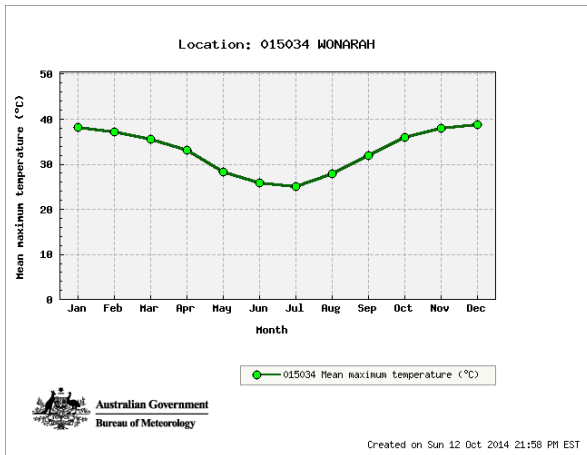
Annual Values

32.9
 18.1
 322.7
 26.9

Years of record

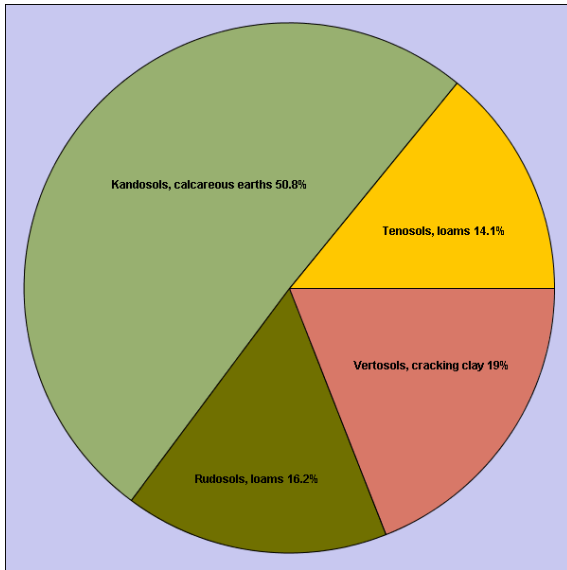
23
 23
 28
 28

Climate summaries from Bureau of Meteorology (www.bom.gov.au)



Custom area Soils

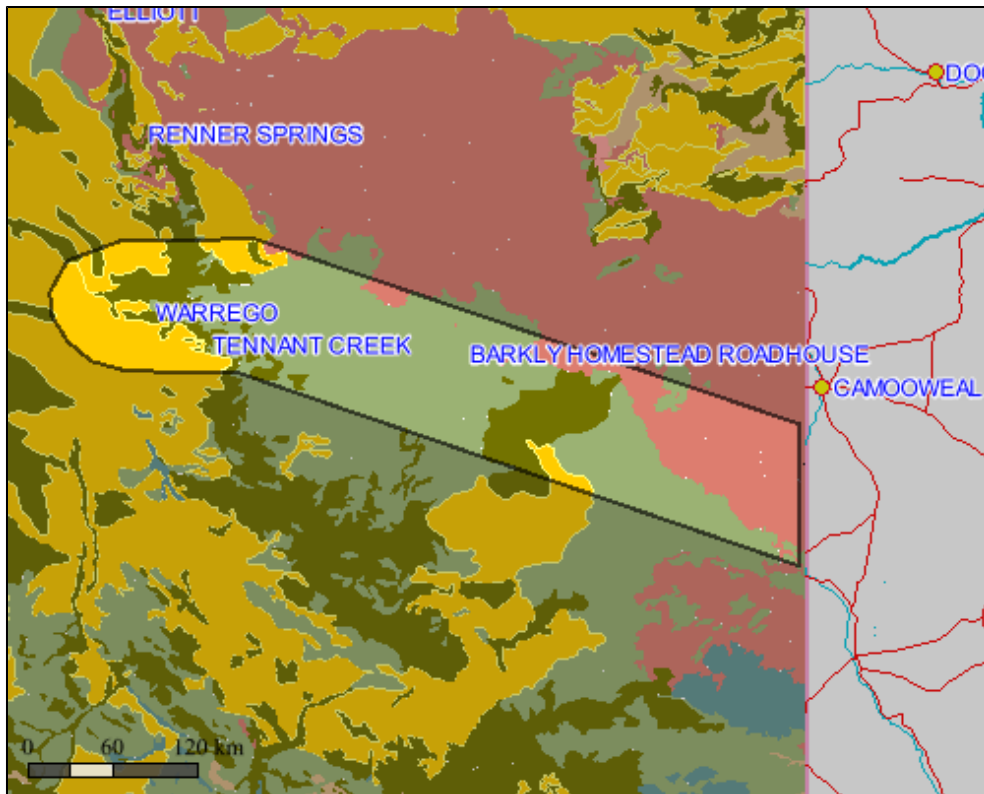
Soil Types



Area of soil types (Northcote Factual Key)

Category	Area sq km	Area%
Kandosols, calcareous earths	23725.89	50.77
Vertosols, cracking clay	8884.65	19.01
Rudosols, loams	7550.89	16.16
Tenosols, loams	6574.82	14.07

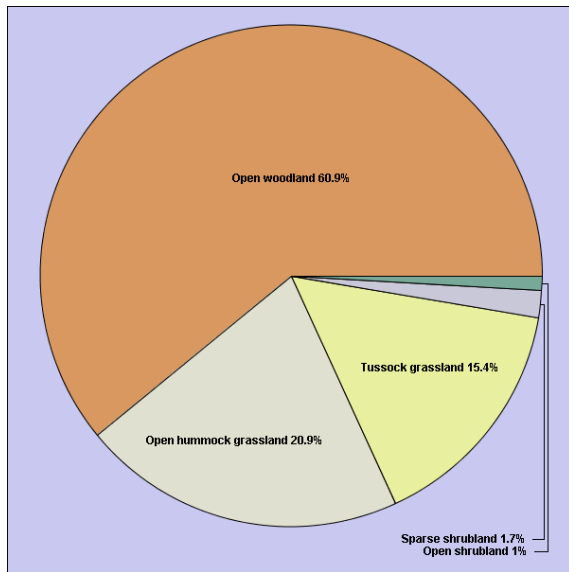
Soil Types



Soils 1:2M Layer is a copy of the NT portion (1:2,000,000 scale dataset) of the CSIRO Atlas of Australian Soils - K.H. Northcote et al. Data scale: 1:2,000,000 ANZLIC Identifier: 2DBC771205D06B6E040CD9B0F274EFE
 More details: Go to www.lrm.nt.gov.au/nrmmapsnt/ and enter the ANZLIC identifier in the Spatial Data Search

Custom area Vegetation

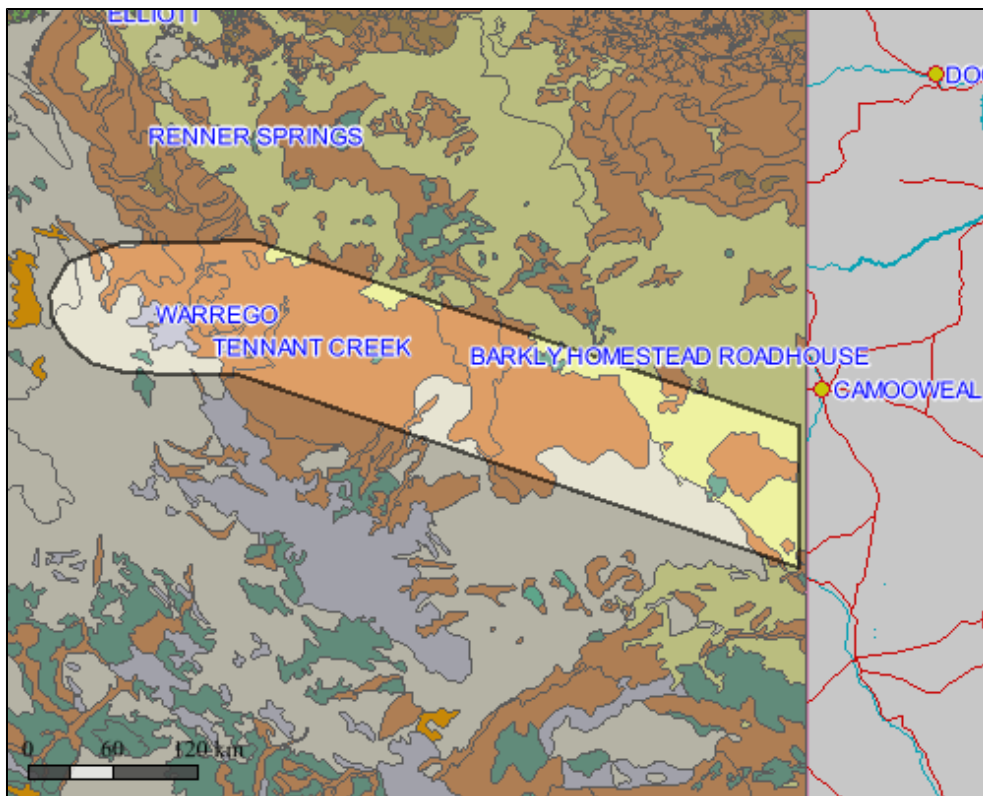
Vegetation Communities



Area of vegetation communities

Category	Area sq km	Area%
Open woodland	28475.96	60.93
Open hummock grassland	9787.89	20.94
Tussock grassland	7209.81	15.43
Sparse shrubland	816.50	1.75
Open shrubland	446.08	.95

Vegetation Communities

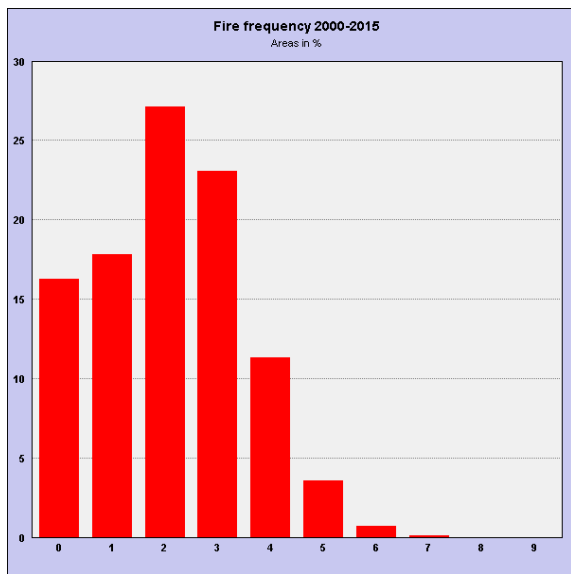


The NVIS 2005 Layer is compiled from a number of vegetation and land unit survey maps that were recoded and re-attributed for the National Vegetation Information System (NVIS)

Data scale variable depending on location. ANZLIC Identifier:2DBC771207006B6E040CD9B0F274EFE
 More details:Go to www.lrm.nt.gov.au/nrm/apsnt/ and enter the ANZLIC identifier in the Spatial Data Search

Custom area Fire History

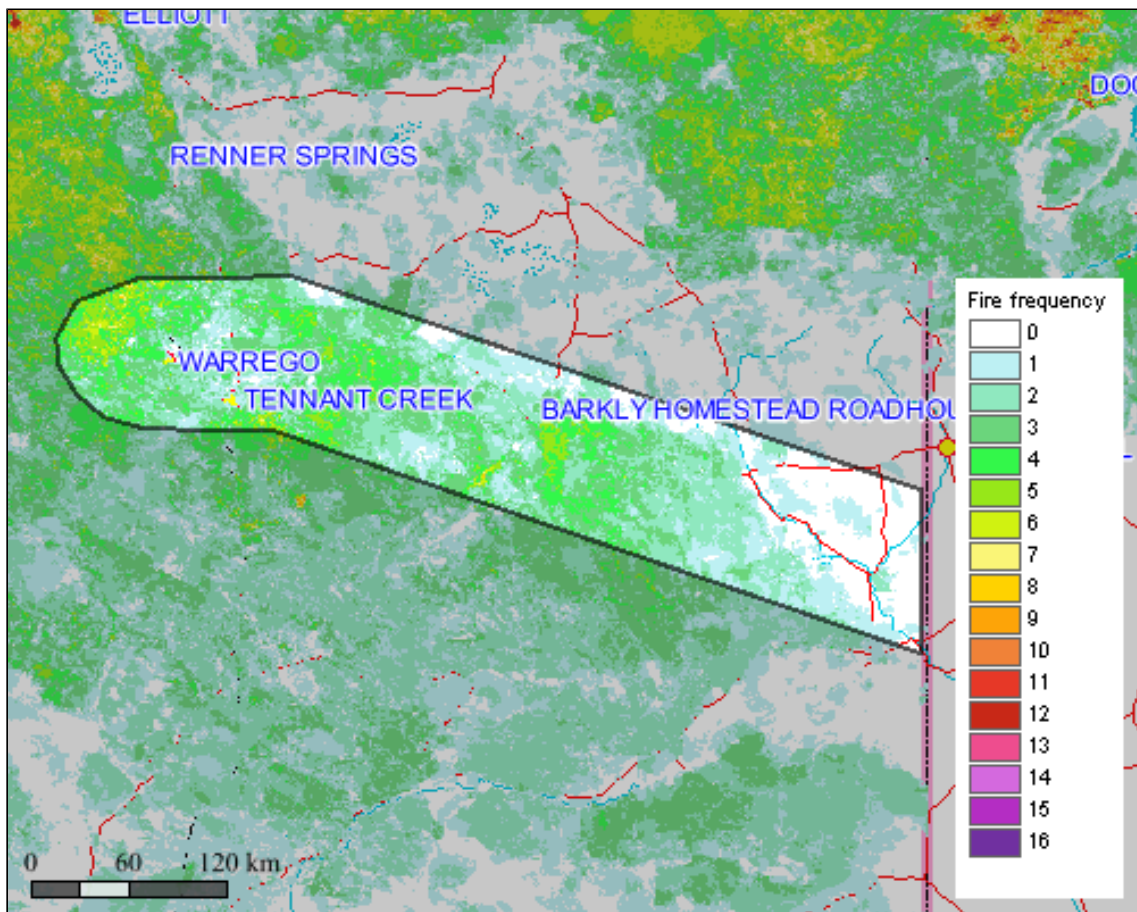
Fire frequency 2000-2015



area burnt for each fire frequency category 2000-2015

Category	Area sq km	Area%
0	7617.68	16.30
1	8325.74	17.81
2	12675.22	27.12
3	10777.60	23.06
4	5289.30	11.32
5	1660.16	3.55
6	327.85	.70
7	55.17	.12
8	7.35	.02
9	.17	.00

Fire frequency 2000-2015



The fire frequency(250m) Layer is derived from satellite imagery sourced from the Moderate Resolution Imaging Spectroradiometer (MODIS) on the NASA Terra satellite
Spatial Resolution: 250m x 250m pixels (at Nadir).

Custom area Threatened Species



Threatened species recorded in Custom area (Records Updated: Sept 2013)

Group	Common Name	Scientific Name	NT Status	National Status	ID	#Observations (Latest)	#Specimens (Latest)	#Surveys (Latest)
Flowering Plants	Sporobolus	<i>Sporobolus latzii</i>	VU	.	.	0 (Unknown)	1 (1993)	0 (Unknown)
Flowering Plants	Tobermorey Melon	<i>Austrobryonia argillicola</i>	VU	.	257219	0 (Unknown)	0 (Unknown)	0 (Unknown)
Snails	Spencer's Land Snail	<i>Bothriembryon spenceri</i>	VU	.	351895	0 (Unknown)	0 (Unknown)	0 (Unknown)
Reptiles	Yellow-spotted Monitor	<i>Varanus panoptes</i>	VU	.	347307	3 (1998)	0 (Unknown)	0 (Unknown)
Reptiles	Plains Death Adder	<i>Acanthophis hawkei</i>	VU	VU	.	0 (Unknown)	1 (1978)	0 (Unknown)
Birds	Grey Falcon	<i>Falco hypoleucos</i>	VU	.	.	6 (2010)	0 (Unknown)	0 (Unknown)
Birds	Masked Owl (northern mainland)	<i>Tyto novaehollandiae kimberli</i>	VU	VU	594609	1 (2001)	0 (Unknown)	0 (Unknown)
Birds	Gouldian Finch	<i>Erythrura gouldiae</i>	VU	EN	176370	1 (1974)	0 (Unknown)	0 (Unknown)
Mammals	Brush-tailed Mulgara	<i>Dasyercus blythi</i>	VU	VU	351695	5 (1998)	2 (1901)	0 (Unknown)
Mammals	Crest-tailed Mulgara	<i>Dasyercus cristicauda</i>	VU	EN	351695	1 (1998)	3 (1905)	0 (Unknown)
Mammals	Golden Bandicoot	<i>Isoodon auratus</i>	EN	VU	176421	3 (1906)	16 (1936)	0 (Unknown)
Mammals	Greater Bilby	<i>Macrotis lagotis</i>	VU	VU	177125	28 (1998)	2 (1969)	2 (2004)
Mammals	Common Brushtail Possum (southern)	<i>Trichosurus vulpecula vulpecula</i>	EN	.	177146	2 (1969)	3 (1901)	0 (Unknown)

EX = Extinct

EW = Extinct in the Wild

ER = Extinct in the NT

EN = Endangered

EN/VU = One Endangered subspecies/One Vulnerable subspecies

VU=Vulnerable

VU/- = One or more subspecies vulnerable EN/- = One or more subspecies endangered

Survey = this category refers to data collected using systematic survey methodology

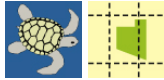
Specimen = this category refers to museum or other records where a specimen has been collected and lodged

Observation = this category refers to all other incidental recordings where systematic methodology may not have been used consistently.

More species info: Go to www.landmanager.org.au/view/index.aspx?id=####

where #### is the ID number from the tables above for the species of interest.

Custom area Threatened Species Grid



Threatened species recorded in the grid cell(s) in which Custom area occurs (Records Updated: Sept 2013)

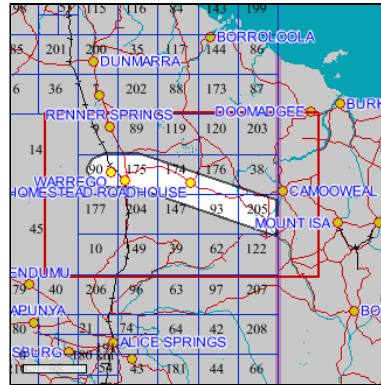
Group	Family Name	Scientific Name	Common Name	NT Status	National Status	#Observations	Latest Observation Date	#Specimens	Latest Specimen Date	#Surveys	Latest Survey Record
Flowering Plants	Poaceae	<i>Sporobolus latzii</i>	Sporobolus	VU		0	Unknown	1	1993	0	Unknown
Flowering Plants	Cucurbitaceae	<i>Austrobryonia argillicola</i>	Tobermorey Melon	VU		0	Unknown	0	Unknown	0	Unknown
Snails	Bulimulidae	<i>Bothriembryon spenceri</i>	Spencer's Land Snail	VU		0	Unknown	0	Unknown	0	Unknown
Reptiles	Varanidae	<i>Varanus panoptes</i>	Yellow-spotted Monitor	VU		3	1998	3	1978	0	Unknown
Reptiles	Elapidae	<i>Acanthophis hawkei</i>	Plains Death Adder	VU	VU	0	Unknown	22	1985	0	Unknown
Birds	Falconidae	<i>Falco hypoleucos</i>	Grey Falcon	VU		8	2010	0	Unknown	0	Unknown
Birds	Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	VU	EN	0	Unknown	2	1993	1	1993
Birds	Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	VU	CE	0	Unknown	0	Unknown	1	1995
Birds	Tytonidae	<i>Tyto novaehollandiae kimberli</i>	Masked Owl (northern mainland)	VU	VU	1	2001	0	Unknown	0	Unknown
Birds	Meliphagidae	<i>Grantiella picta</i>	Painted Honeyeater	VU	VU	1	1981	0	Unknown	0	Unknown
Birds	Estrildidae	<i>Erythrura gouldiae</i>	Gouldian Finch	VU	EN	1	1974	0	Unknown	0	Unknown
Mammals	Dasyuridae	<i>Dasyercus blythi</i>	Brush-tailed Mulgara	VU	VU	5	1998	2	1901	0	Unknown
Mammals	Dasyuridae	<i>Dasyercus cristicauda</i>	Crest-tailed Mulgara	VU	EN	1	1998	3	1905	0	Unknown
Mammals	Dasyuridae	<i>Dasyurus hallucatus</i>	Northern Quoll	CR	EN	2	1903	0	Unknown	0	Unknown
Mammals	Dasyuridae	<i>Pseudantechinus mimulus</i>	Carpentarian Antechinus		VU	2	1969	0	Unknown	0	Unknown
Mammals	Peramelidae	<i>Isoodon auratus</i>	Golden Bandicoot	EN	VU	11	1969	16	1936	0	Unknown
Mammals	Thylacomyidae	<i>Macrotis lagotis</i>	Greater Bilby	VU	VU	84	2009	6	1969	2	2004
Mammals	Phalangeridae	<i>Trichosurus vulpecula vulpecula</i>	Common Brushtail Possum (southern)	EN		7	1969	3	1901	0	Unknown
Mammals	Macropodidae	<i>Petrogale lateralis</i>	Black-footed Rock-wallaby		VU	14	1992	0	Unknown	2	2004

EX = Extinct
 EW = Extinct in the Wild
 ER = Extinct in the NT
 EN = Endangered
 EN/VU = One Endangered subspecies/One Vulnerable subspecies
 VU = Vulnerable
 VU/- = One or more subspecies vulnerable EN/- = One or more subspecies endangered

Survey = this category refers to data collected using systematic survey methodology
 Specimen = this category refers to museum or other records where a specimen has been collected and lodged
 Observation = this category refers to all other incidental recordings where systematic methodology may not have been used consistently.

More species info: Go to www.landmanager.org.au/view/index.aspx?id=####
 where #### is the ID number from the tables above for the species of interest.

Species listed in the table above were recorded from all the grid cells shown below (red/blue line) that overlap Custom area



Custom area Weeds and Potential Weeds



Introduced plants recorded in the grid cell(s) in which Custom area occurs and that have been identified as problem weeds in one or more locations in northern Australia. Occurrence based on Northern Territory Government databases.

Family Name	Scientific Name	Common Name	NT Status	National Status	Other Status	#Surveys	Latest Record
Asteraceae	<i>Acanthospermum hispidum</i>	Starburr	B C			2	2001
Amaranthaceae	<i>Alternanthera pungens</i>	Khaki Weed	B C		DEU NSW SA	0	Unknown
Meliaceae	<i>Azadirachta indica</i>	Neem			MP K1 C&E G&M CYP WeedsAus	0	Unknown
Poaceae	<i>Bothriochloa pertusa</i>	Indian Bluegrass			DEU	0	Unknown
Brassicaceae	<i>Brassica tournefortii</i>	Mediterranean Turnip			Gr	0	Unknown
Apocynaceae	<i>Calotropis procera</i>	Rubber Bush	B C (S of 16 5 deg S)		WA1 WA2 G&M	0	Unknown
Poaceae	<i>Cenchrus biflorus</i>	Gallon`s Curse			NSW	2	2001
Poaceae	<i>Cenchrus ciliaris</i>	Buffel Grass			MP Gr G&M DEU	0	Unknown
Poaceae	<i>Cenchrus echinatus</i>	Mossman River Grass	B C		NSW	0	Unknown
Poaceae	<i>Cenchrus pedicellatus</i> subsp. <i>unispiculus</i>	Mission Grass (annual)			WeedsAus	0	Unknown
Poaceae	<i>Cenchrus setiger</i>	Birdwood Grass			DEU	0	Unknown
Poaceae	<i>Chloris barbata</i>	Purpletop Chloris			DEU	0	Unknown
Poaceae	<i>Chloris virgata</i>	Feathertop Rhodes Grass			DEU	0	Unknown
Cucurbitaceae	<i>Citrullus lanatus</i>	Camel Melon			G&M	0	Unknown
Brassicaceae	<i>Coronopus didymus</i>	Lesser Swinecress			G&M	0	Unknown
Cucurbitaceae	<i>Cucumis melo</i>	Ulicardo Melon			DEU	36	2001
Solanaceae	<i>Datura ferox</i>	Fierce Thornapple	A C		WA1 WA3 WA4 G&M	0	Unknown
Solanaceae	<i>Datura leichhardtii</i>	Native Thornapple	C		WA1 WA3 WA4	0	Unknown
Poaceae	<i>Echinochloa colona</i>	Awnless Barnyard Grass			DEU	11	2001
Boraginaceae	<i>Echium plantagineum</i>	Paterson`s Curse	A C		WA1 WA3 WA4 NSW SA	0	Unknown
Poaceae	<i>Eragrostis tenuifolia</i>	Elastic Grass			DEU	0	Unknown
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena Weed			DEU	1	2001
Lamiaceae	<i>Hyptis suaveolens</i>	Hyptis	B C		G&M	0	Unknown
Euphorbiaceae	<i>Jatropha gossypifolia</i>	Bellyache Bush	B C	WONS	K2 WA1 WA4 Q2 C&E G&M CYP DEU	0	Unknown
Fabaceae	<i>Leucaena leucocephala</i> subsp. <i>leucocephala</i>	Coffee Bush			MP C&E G&M CYP	0	Unknown
Fabaceae	<i>Macroptilium atropurpureum</i>	Siratro			C&E	0	Unknown
Malvaceae	<i>Malvastrum americanum</i>	Spiked Malvastrum			DEU	41	2003
Malvaceae	<i>Malvastrum</i> <i>coromandelianum</i>	Prickly Malvastrum			DEU	0	Unknown

Family Name	Scientific Name	Common Name	NT Status	National Status	Other Status	#Surveys	Latest Record
Poaceae	<i>Melinis repens</i>	Red Natal Grass			DEU	0	Unknown
Oxalidaceae	<i>Oxalis corniculata</i>	Creeping Wood-sorrel			NSW	0	Unknown
Fabaceae	<i>Parkinsonia aculeata</i>	Parkinsonia	B C	WONS	MP K2 WA1 WA4 Q2 G&M CYP DEU NSW SA	14	2001
Fabaceae	<i>Prosopis pallida</i>	Mesquite	A C	WONS	K2 WA1 WA2 WA4 Q2 G&M NSW SA	1	2001
Fabaceae	<i>Senna obtusifolia</i>	Sicklepod	B C		WA1 WA2 Q2 G&M CYP DEU	1	1995
Fabaceae	<i>Senna occidentalis</i>	Coffee Senna	B C		G&M DEU	1	2001
Malvaceae	<i>Sida acuta</i>	Spiny-head Sida	B C		WA1 G&M	0	Unknown
Malvaceae	<i>Sida cordifolia</i>	Flannel Weed	B C		WA1 G&M DEU	3	1995
Malvaceae	<i>Sida spinosa</i>	Spiny Sida			DEU	61	2001
Poaceae	<i>Sporobolus africanus</i>	Parramatta grass			Q2 G&M	0	Unknown
Poaceae	<i>Sporobolus coromandelianus</i>	Madagascar Dropseed			DEU	0	Unknown
Poaceae	<i>Sporobolus pyramidalis</i>	Giant Rat's Tail Grass			Q2 G&M CYP NSW	2	1995
Fabaceae	<i>Stylosanthes hamata</i>	Caribbean Stylo			DEU	0	Unknown
Fabaceae	<i>Stylosanthes humilis</i>	Townsville Lucerne			DEU	1	2003
Tamaricaceae	<i>Tamarix aphylla</i>	Athel Pine	B C	WONS	WA1 Q3 C&E G&M NSW	0	Unknown
Zygophyllaceae	<i>Tribulus terrestris</i>	Caltrop	B C		CYP SA	13	1996
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass			DEU	0	Unknown
Poaceae	<i>Urochloa mutica</i>	Para Grass			MP G&M	0	Unknown
Fabaceae	<i>Vachellia farnesiana</i>	Sweet Acacia			DEU	27	2001
Fabaceae	<i>Vachellia nilotica</i>	Prickly Acacia	A C	WONS	MP K2 Q2 G&M DEU NSW	0	Unknown
Asteraceae	<i>Xanthium strumarium</i>	Noogoora Burr	B C		MP WA1 WA2 WA4 DEU NSW SA	19	2001

Status Codes:

1. NATIONAL STATUS CODES

Alert, Alert List for Environmental Weeds (Please call Exotic Plant Pest Hotline 1800 084 881 if you think you have seen this weed)

Sleeper, National Sleeper Weed

Target, Targeted for eradication. (www.landmanager.com.au/view/index.aspx?id=449837)

WONS, Weeds of National Significance

2. NT STATUS CODES

A, NT Class A Weed (to be eradicated)

B, NT Class B Weed (growth & spread to be controlled)

C, NT Class C Weed (not to be introduced) (www.landmanager.com.au/view/index.aspx?id=449869)

3. OTHER STATUS CODES

C&E, Csurhes, S. & Edwards, R. (1998) Potential Environmental Weeds in Australia. Candidate Species for Preventative Control. Environment Australia, Canberra (www.landmanager.com.au/view/index.aspx?id=394504)

CYP, Draft Cape York Peninsula Pest Management Plan 2006-2011 (www.landmanager.com.au/view/index.aspx?id=371200)

DEU, Plants listed as environmental weeds by the Desert Uplands Strategic Land Resource

Assessment (www.landmanager.com.au/view/index.aspx?id=332123)

G&M, Grice AC, Martin TG. 2005. The Management of Weeds and Their Impact on Biodiversity in the Rangelands. Cooperative Research Centre (CRC) for Australian Weed Management and CSIRO Sustainable Ecosystems. Commonwealth Australia (www.landmanager.com.au/view/index.aspx?id=163572)

Gr, Groves et al. 2003. Weed categories for natural and agricultural ecosystem management. Bureau of Rural Sciences (www.landmanager.com.au/view/index.aspx?id=388018)

K0, High Priority Weeds not yet established in the Katherine region

K1, High Priority Weeds posing environmental threats in the Katherine region

K2, High Priority Weeds posing existing threats in the Katherine region, as described in the Katherine Regional Weed Management Strategy 2005-2010 (www.landmanager.com.au/view/index.aspx?id=130286)

MP, Northern Territory Parks & Conservation Masterplan (www.landmanager.com.au/view/index.aspx?id=144141)
NAQS, North Australian Quarantine Strategy Target List (www.landmanager.com.au/view/index.aspx?id=449416)
NSW, Declared Noxious Weed in NSW (www.landmanager.com.au/view/index.aspx?id=449983)
Q1, QLD Class 1 Weed (not to be introduced, kept or supplied)
Q2, Class 2 Weed (eradicate where possible, not to be introduced, kept or supplied)
Q3, Qld Class 3 Weed (to be controlled near environmentally sensitive areas- not to be supplied/sold without a permit) (www.landmanager.com.au/view/index.aspx?id=190714)
SA, Declared Plant in South Australia (www.landmanager.com.au/view/index.aspx?id=449996)
WeedsAus, Listed as a significant weed by Weeds Australia (www.landmanager.com.au/view/index.aspx?id=14576)
WA1, WA Weed Class P1 (movement prohibited)
WA2, WA Weed Class P2 (aim to eradicate)
WA3, WA Weed Class P3 (control infestations)
WA4, WA Weed Class P4 (prevent spread)
WA5, WA Weed Class P3 (control infestations on public land) (www.landmanager.com.au/view/index.aspx?id=449884).

Survey = this category refers to data collected using systematic survey methodology
Specimen = this category refers to museum or other records where a specimen has been collected and lodged
Observation = this category refers to all other incidental recordings where systematic methodology may not have been used consistently.

More species info: Go to www.landmanager.org.au/view/index.aspx?id=####
where #### is the ID number from the tables above for the species of interest.

Plants listed in the table above were recorded from all the grid cells shown below (red/blue line) that overlap Custom area

Custom area Pest and Potential Pest Animals



Animals with pest potential recorded in the grid cell(s) in which Custom area occurs. Occurrence based on Northern Territory Government databases.

Common Name	Scientific Name	NT Status	National Status	ID	#Observations (Latest)	#Specimens (Latest)	#Surveys (Latest)
Asian House Gecko	<i>Hemidactylus frenatus</i>	P	.	188964	3 (1991)	4 (2000)	0 (Unknown)
Rock Dove	<i>Columba livia</i>	P	.	183336	2 (2001)	0 (Unknown)	0 (Unknown)
Red-tailed Black-cockatoo	<i>Calyptorhynchus banksii macrorhynchus</i>	N	.	223765	14 (2002)	0 (Unknown)	2 (2004)
Sulphur-Crested Cockatoo	<i>Cacatua galerita</i>	N	.	223772	1 (1998)	0 (Unknown)	1 (1995)
House Sparrow	<i>Passer domesticus</i>	P	.	183322	28 (2004)	16 (Unknown)	0 (Unknown)
Agile Wallaby	<i>Macropus agilis</i>	N	.	223786	1 (1985)	0 (Unknown)	0 (Unknown)
House Mouse	<i>Mus musculus</i>	P	.	187720	29 (1996)	39 (1996)	3 (2011)
Black Rat	<i>Rattus rattus</i>	P	.	183236	0 (Unknown)	2 (1960)	0 (Unknown)
Dingo / Wild dog	<i>Canis lupus</i>	N	.	183280	29 (2009)	180 (1973)	15 (2011)
Fox	<i>Vulpes vulpes</i>	P	.	183294	15 (2009)	0 (Unknown)	2 (2011)
Cat	<i>Felis catus</i>	P	.	183259	35 (2010)	13 (1980)	9 (2011)
Rabbit	<i>Oryctolagus cuniculus</i>	P	.	187331	11 (1992)	0 (Unknown)	0 (Unknown)
Donkey	<i>Equus asinus</i>	P	.	183287	19 (2009)	0 (Unknown)	3 (2004)
Horse	<i>Equus caballus</i>	P	.	183315	14 (1999)	0 (Unknown)	0 (Unknown)
Pig	<i>Sus scrofa</i>	P	.	183329	12 (1999)	0 (Unknown)	0 (Unknown)
Camel	<i>Camelus dromedarius</i>	P	.	183210	4 (2009)	0 (Unknown)	0 (Unknown)
Cattle	<i>Bos taurus</i>	P	.	183266	9 (2010)	0 (Unknown)	29 (2011)

NT STATUS CODES:

Int, Introduced species (all non-prohibited vertebrates, and all other exotic species (www.landmanager.com.au/view/index.aspx?id=280771))

N, Native species with pest potential.

P, Prohibited species (all exotic vertebrates except those listed as non-prohibited (www.landmanager.com.au/view/index.aspx?id=450509))

Survey = this category refers to data collected using systematic survey methodology

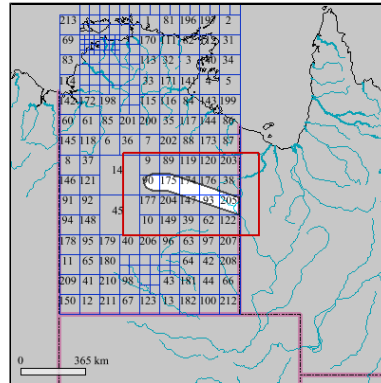
Specimen = this category refers to museum or other records where a specimen has been collected and lodged

Observation = this category refers to all other incidental recordings where systematic methodology may not have been used consistently.

More species info: Go to www.landmanager.org.au/view/index.aspx?id=####

where #### is the ID number from the tables above for the species of interest.

Potential pest animals listed in the table above were recorded from all the grid cells shown below (red/blue line) that overlap Custom area



Soils and vegetation graphs and tables refer to area of soils and vegetation only. Fire graphs and tables refer to entire selected area including sea if present. Calculations are derived from map images or vector data, and should be taken as a guide only. Accuracy cannot be guaranteed. For small areas, figures should be rounded to the nearest whole number.

This page has been intentionally left blank

Appendix E

Threatened species likelihood of occurrence assessment

This page has been intentionally left blank

Threatened species 'likelihood of occurrence' assessment

This 'likelihood of occurrence' assessment identifies which threatened species have potential to occur within the Project footprint. The following procedure was used to determine the likelihood of occurrence of threatened species:

- 1) Identify potential habitat features within the Project footprint using available desktop information (i.e. land unit mapping, existing vegetation mapping, aerial imagery, fire history etc.).
- 2) Search within a 50 km buffer of the pipeline route for
 - a. Matters of National Environmental Significance (MNES) using the Protected Matters Search Tool (most recently undertaken 9 May 2016) (Appendix C).
 - b. NT threatened species listed under the *Territory Parks and Wildlife Conservation Act* using the online tool *NT NRM Infonet* (Appendix D).
- 3) Collate the following details for each of those species – conservation status (NT and Federal), habitat requirements, distribution and number of records within the search area (from the Infonet report).
- 4) Analyse the likelihood that each species will occur in the Project footprint by applying the following likelihood classifications:
 - a. **HIGH** – it is expected that this species will be within the Project footprint because of the presence of suitable habitat, and/or there are recent proximate records (i.e. post-2000).
 - b. **MEDIUM** – this species may occur within the Project footprint; however, there is evidence that lowers its likelihood of occurrence (i.e. lack of core habitat, no recent records with the search area, habitat degradation etc.).
 - c. **LOW** – it is not expected that this species is supported within the Project footprint, as there is no suitable habitat for the species and/or current threats in the region are known to have significantly impacted the species.
 - d. **NONE** – there is strong evidence that this species will not occur within the Project footprint.

Note: For many threatened species, the Atlas of Living Australia provides 'likely' and 'possible' modelled expert distributions. These distributions are referred to throughout this document and mostly come from the Species of National Environmental Significance Database maintained by the federal Department of the Environment.

The location of some threatened species records from the Atlas of Living Australia has been generalised to 0.1 degree (introducing a location variance of up to 11 km) due to concerns that revealing the actual location may lead to poaching. Spatially-generalised records have been considered in this assessment; however, use of these records has been noted where relevant.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
BIRDS				
Red Goshawk <i>Erythrotriorchis radiatus</i>	VU	VU	<p>Habitat: Prefers tall, open Eucalypt forest and riparian areas. Nests in large trees, frequently the tallest and most massive in a tall stand, nest trees are invariably within 1 km of permanent water (Debus et al. 1988; Aumann et al. 1991).</p> <p>Distribution: Sparsely distributed across much of the northern Australia, from the Kimberley to south-eastern Qld. Within this range, generally occurs in taller forests characteristic of higher rainfall areas, but there are some isolated records from central Australia. However, no breeding has been recorded in central Australia and these records are thought to be of dispersive individuals (Czechura cited in DoE 2016a).</p> <p>Records: There is a single, undated record from within the Mount Isa township 9.7 km north of the construction ROW.</p>	<p>LOW (NT & Qld)</p> <ul style="list-style-type: none"> • There is no suitable habitat within the Project footprint. It is not near to any tall open Eucalypt forests and, although it intersects riparian vegetation along major rivers, these do not contain, or are not near, permanent water. • The single record for the region has no date associated with it and is well outside the usual range of this species. There are a few records across arid Australia, but these are almost certainly vagrants. • The Project footprint is outside the <i>expert distribution (likely)</i> but within the <i>expert distribution (maybe)</i>. This is probably due to the single record discussed above.
Gouldian Finch <i>Erythrura gouldiae</i>	VU	EN	<p>Habitat: Prefers annual and perennial grasses (especially Sorghum), a nearby source of surface water and – in the breeding season – unburnt, hollow-bearing Eucalyptus trees (especially <i>E. tintinnans</i>, <i>E. brevifolia</i> and <i>E. leucophloia</i>) (Tidemann 1996; O'Malley 2006).</p> <p>Distribution: Sparsely across northern Australia from the Kimberley to north-central QLD (Dostine 1998; Franklin 1999; Barrett et al. 2003; Franklin et al. 2005). Non-breeding birds disperse widely (Garnett et al. 2011), greatly increasing the possible range of this species.</p> <p>Records: Approximately 14 birds were observed at Lady Loretta Mine Rd, approximately 100 km NW of Mount Isa in 2011. There is a second record (with a high degree of spatial uncertainty) of the species approximately 25 km north east of the construction ROW – potentially associated with Lake Moondarra. These are the nearest records to the Project footprint.</p>	<p>NONE (NT) / MEDIUM (Qld)</p> <ul style="list-style-type: none"> • There is no suitable habitat within the Project footprint in the NT. • In Qld, vegetation mapping indicates the Project footprint passes rocky slopes containing <i>E. leucophloia</i> near Mount Isa which could provide suitable habitat. • The Project footprint is outside the <i>expert distribution (likely)</i> except for a small section at the Mount Isa end – probably due to the record discussed in Species details. The rest of the Project footprint is outside the <i>expert distribution (maybe)</i>. • This species' core distribution is many hundreds of kilometres to the north of the Project footprint. The Mount Isa end of the Project footprint is the nearest to the southern extent of this species' distribution (although still a few hundred kilometres away). Therefore, the two records near to Mount Isa are likely to be dispersing, non-breeding birds.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
Night Parrot <i>Pezoporus occidentalis</i>	CE	EN	<p>Habitat: Flat spinifex (<i>Triodia</i> spp.) grasslands in stony or sandy environments; and samphire and chenopod shrublands – including genera such as <i>Atriplex</i>, <i>Bassia</i> and <i>Maireana</i> – on floodplains and claypans, and on the margins of saltlakes, creeks or other sources of water (from a variety of sources cited in DoE 2016b).</p> <p>Distribution: Extremely sparsely distributed through central arid regions. In the NT sightings were made up to 1923 in the Alice Springs region (Whitlock 1924). Recently recorded in western Qld (undisclosed location).</p> <p>Records: There are no records from the Barkly Tablelands. The closest record (from 1993) to the Project footprint is 110 km to the south-east of the Project footprint in Qld.</p>	<p>LOW (NT & Qld)</p> <ul style="list-style-type: none"> There are no recent or historical records of the species within the Project footprint. The Project footprint is outside the <i>expert distribution (likely)</i> and <i>expert distribution (maybe)</i>. The <i>Triodia</i> spp. grasslands within the construction ROW are generally 'young hummock' due to relatively high frequency of fire (every 5 to 7 years) rather than the preferred dense and old <i>Triodia</i> hummocks.
Australian Painted Snipe <i>Rostratula australis</i>	VU	EN	<p>Habitat: Fringes of permanent and temporary wetlands, swamps and inundated grasslands (Taylor et al. 2013).</p> <p>Distribution: Nomadic and scattered across Australia with no predictable occurrence (Rogers 2001) but could occur at any wetland or inundated grassland across its distribution, including nearly all of the NT and Qld (Garnett et al. 2011).</p> <p>Records: Apart from records within Mount Isa township, there is one spatially-generalised record within the region attributed to nearby Barkly Homestead in Queensland.</p>	<p>LOW (NT & Qld)</p> <ul style="list-style-type: none"> There are suitable permanent and ephemeral wetlands within the region; however, there are no wetlands within the Project footprint. The Project footprint is outside the <i>expert distribution (likely)</i> but within <i>expert distribution (maybe)</i>. There is a record for this species proximate to the Project footprint, likely from one of the seasonal wetlands between the construction ROW and the Barkly Highway.
Masked Owl (Northern) <i>Tyto novaehollandiae kimberli</i>	VU	VU	<p>Habitat: Mainly in Eucalyptus tall open forests (especially those dominated by <i>Eucalyptus miniata</i> and <i>E. tetradonta</i>), but also roosts in monsoon rainforests and forages in more open vegetation types, including grasslands (Woinarski & Ward 2006).</p> <p>Distribution: Poorly known, with few records from across its broad range in northern Australia. In the NT records known from the Top End, Kakadu, Coburg Peninsula (majority of records) and south-west Gulf country (Woinarski & Ward 2006). In Qld, records are confined to the northern coastal forests and woodlands.</p> <p>Records: There is a single Masked Owl record from the Barkly Tablelands (at Dead Dog Waterhole), approximately 20 km south of the Project Footprint (KP425).</p>	<p>NONE</p> <ul style="list-style-type: none"> There is no suitable habitat within the Project footprint. The Project footprint is well outside the <i>expert distribution (likely)</i> and <i>expert distribution (maybe)</i>. The only proximate record is considerably outside the expert distribution of this species, and is more than 500 km south of the next nearest record. This record could be a misidentification of the similar Barn Owl.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
Grey Falcon <i>Falco hypoleucos</i>	VU	-	<p>Habitat: Areas of lightly-timbered lowland plains, typically on inland drainage systems, where the average annual rainfall is less than 500 mm (Ward 2012a).</p> <p>Distribution: Sparsely through much of the arid and semi-arid areas of Australia, but is recorded across the country. In the NT, the majority of records are from the southern half, but there are records all the way up to Darwin (Ward 2012).</p> <p>Records: There are four recent (after 1990) records within 15 km of the NT section of the construction ROW.</p>	<p>HIGH (NT) / NA (Qld)</p> <ul style="list-style-type: none"> • There is suitable habitat within the Project footprint. • The Project footprint is within the <i>expert distribution</i>. • There are records for this species near the construction ROW and from within similar habitat to that within the Project footprint. • Likelihood of occurrence has only been considered in NT as it is not listed as threatened in Qld on federally.
Painted Honeyeater <i>Grantiella picta</i>	VU	VU	<p>Habitat: <i>Acacia</i> and <i>Eucalyptus</i>-dominated woodlands and open forest, preferring habitats with more mature trees that host more mistletoe. Breeding times and seasonal movements (south to north) are likely governed by the fruiting of mistletoe (Garnett et al. 2011).</p> <p>Distribution: Across eastern and northern parts of the country – but nowhere very numerous (Ward 2012b). Many birds move after breeding to semi-arid regions such as north-eastern SA, central and western Qld, and central NT (TSSC 2015). Few NT records – most from the Barkly Tablelands – but no evidence of a breeding population in the NT, and the records are thought to be of irregular visitors from the south-east (Ward 2012b).</p> <p>Records: There are two records from the NT – one in 2014 from Three Ways, one in 2016 from south of Tennant Creek, that are 4.8 km and 20 km from the construction ROW respectively. There is one spatially-verified record within the Project footprint at Mica Creek (from 2006), and two other records (1932 and date unknown) from the Mount Isa region.</p>	<p>LOW (NT) / HIGH (Qld)</p> <ul style="list-style-type: none"> • There is no suitable habitat within the Project footprint in the NT. The records from the NT are generally accepted to be irregular visitors. • There is suitable at the Mount Isa end of the Project footprint in the Qld. • The Project footprint is within the <i>expert distribution</i> at the Mount Isa • There is a record for this species in the Project footprint at Mica Creek.
Princess Parrot <i>Polytelis alexandrae</i>	VU	VU	<p>Habitat: Occurs in swales between sand dunes with a shrub layer of vegetation and scattered trees (Pavey 2006a).</p> <p>Distribution: Confined to arid regions of Western Australia, the Northern Territory, and South Australia (Barrett et al. 2003; Blakers et al. 1984; Higgins 1999). There have been unconfirmed reports of the species from western Queensland (Britton 1992; Higgins 1999).</p> <p>Records: There is one record from the</p>	<p>LOW (NT & Qld)</p> <ul style="list-style-type: none"> • There is no suitable habitat within the Project footprint. • The Project footprint is well outside of the <i>expert distribution</i>. • There is a single proximate record; however, this species is highly nomadic. It is noted in DoE (2016c) that the species is an irregular visitor (sometimes at intervals of more than 20 years) to

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
			Barkly Highway, 21 km north of KP 98.	most sites in its range and its movements are largely unknown. For these reasons, it is not possible or practical to provide an estimate of the number of locations at which the species occurs.
Curlew Sandpiper <i>Calidris ferruginea</i>	VU	CE	<p>Habitat: Mostly inhabits coasts and estuaries, but also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand (DoE 2016d).</p> <p>Distribution: A summer migrant from the northern hemisphere. Mostly widespread around the northern Australian coast, less common in the south, with few inland records (Chatto 2003).</p> <p>Records: There are no records from the NT close to the construction ROW. In Qld, there are six recent and records around Mount Isa – all from Lake Moondarra. Another three undated or old (1968) records are from west of Mount Isa approximately 10 km from the construction ROW.</p>	<p>LOW (NT & Qld)</p> <ul style="list-style-type: none"> • There is no suitable habitat within the Project footprint. • The Mount Isa end of the Project footprint is within the <i>expert distribution (likely)</i>. • The records near Mount Isa are associated with Lake Moondarra – which presents the most suitable habitat within the region but is outside the construction ROW.
MAMMALS				
Greater Bilby <i>Macrotis lagotis</i>	VU	VU	<p>Habitat: In the NT, hummock grasslands on sandy soils with a preference for palaeo-drainage lines (Southgate 1990). Has large foraging area and will move home range in search for food (Johnson 2008). In Qld, it occurs on clay plains dominated by Mitchell Grass.</p> <p>Distribution: Historically widespread in arid Australia. Currently in the NT stronghold is the Tanami Desert (Pavey 2006). There are also small populations in far south-western Qld.</p> <p>Records: In the NT, there are 25 records within 50 km of the Project footprint – 12 of which have occurred between 1990 and 2004. It is unknown whether these records are burrows or sightings. There are no recent records within the vicinity of the Qld Project footprint, as currently known populations have retracted to the south-west of Qld (approximately 350 km from the Project footprint).</p>	<p>MEDIUM (NT) / NONE (Qld)</p> <ul style="list-style-type: none"> • A large area of the Project footprint in the NT contains suitable habitat. • None of the Qld Project footprint contains suitable habitat. • The entire Project footprint is within the <i>expert distribution (likely)</i>. • The range of this species has contracted considerably since the last proximate records, such that it is suspected the Wakaya Desert population is now extinct.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
Southern Marsupial Mole <i>Notoryctes typhlops</i>	EN	-	<p>Habitat: Sandy deserts mostly associated with dunes, sandy plains and river flats (Pavey 2006b).</p> <p>Distribution: Central WA, northern SA and southern NT. Seems to be confined to the southern and western sections of the NT (Benshemesh & Schultz 2008) where it has been found as far north as Barrow Creek (Pavey 2006b).</p> <p>Records: There are no database records of the species to the east of the Stuart Hwy (i.e. in the Wakaya Desert). The nearest records are more than 100 km to the west and to the south of the easternmost end of the Project footprint.</p>	<p>NONE</p> <ul style="list-style-type: none"> Not federally-listed, therefore likelihood of occurrence in Qld has not been considered. There is no suitable habitat within the Project footprint. The species is known to occur within sand plains; however, they are generally found close to dune habitat, which does not occur within the Project footprint. The nearest records are more than 100 km to the west and to the south of the easternmost end of the Project footprint. About half of the Project footprint in the NT is within the <i>expert distribution (likely)</i>, and further quarter within the <i>expert distribution (maybe)</i>.
Black-footed Rock-wallaby <i>Petrogale lateralis</i> <i>(MacDonnell Ranges race)</i>	VU	VU	<p>Habitat: Upland rocky areas with associated steep slopes (Pavey 2006c).</p> <p>Distribution: In the NT, this species is mostly found in the MacDonnell Ranges, but also occurs throughout the arid southern end of the NT (Pavey 2006c) and may be found in the Davenport and Murchison Ranges. There are no Qld records for this species.</p> <p>Records: There are two records from 1987 approximately 50 km south of the Project footprint.</p>	<p>LOW (NT) / NONE (Qld)</p> <ul style="list-style-type: none"> There is no suitable habitat within the Project footprint. The Project footprint is outside the <i>expert distribution (likely)</i>, but within the <i>expert distribution (maybe)</i>. The nearest records are approximately 50 km to the south of the Project footprint, and in habitat that does not occur within the Project footprint.
Carpentarian Antechinus <i>Pseudantechinus mimulus</i>	VU	VU	<p>Habitat: A range of vegetation types that are consistently associated with a high cover of rocks and boulders (Johnson et al. 2008). Within Qld, the records come from rocky habitat with open woodland dominated by <i>Eucalyptus leucophloia</i>, <i>E. normantonensis</i> and <i>Corymbia terminalis</i> spp. and <i>Enneapogon</i> spp.</p> <p>Distribution: Only known from Sir Edward Pellew group of islands in the NT (Kitchener 1991; Johnson & Kerle 1991; Taylor et al. 2004) and from a few records north and east of Mount Isa (Woinarski 2004, Woinarski & Ward 2012).</p> <p>Records: The closest records are from Qld (at three locations) and are all approximately 38 km from the ROW.</p>	<p>NONE (NT) / HIGH (Qld)</p> <ul style="list-style-type: none"> There is suitable habitat within the sandstone hills and boulders to the west of the Mount Isa end of the Project footprint. The Mount Isa end of the Project footprint is within the <i>expert distribution (likely)</i>. There are no records proximate to the Project footprint; however, this is a poorly surveyed species.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
Golden Bandicoot <i>Isoodon auratus</i>	EN	VU	<p>Habitat: Mainly in heathland and shrubland on sandstone sheets, avoiding vegetation with greater tree cover (Palmer et al. 2012; Southgate et al. 1996)</p> <p>Distribution: Formerly across most of northern, central and western Australia (across a broad range of habitats), but now only recorded population on mainland Australia is within the Kimberley (Palmer et al. 2012). In the NT the species is confined to the offshore islands of Arnhem Land.</p> <p>Records: The only records from mainland NT are from the north-east corner of Arnhem Land between 1950 and 1980.</p>	<p>NONE</p> <ul style="list-style-type: none"> This species is likely regionally extinct.
Brush-tailed Mulgara <i>Dasyercus blythi</i>	VU	-	<p>Habitat: A range of vegetation types, but prefer mature hummock grasslands of spinifex, especially <i>Triodia basedowii</i> and <i>T. pungens</i> (Pavey & Woinarski 2006; Masters et. al. 2003). Digs burrows between sand dunes (Woolley 2008).</p> <p>Distribution: Because most previous records did not distinguish between the two species of mulgara now recognised, there is ambiguity about the distribution of both species. This species is known from at least the Western and Simpson Deserts, with confirmed records in the NT from Haast Bluff, Uluru, Papunya, Tanami Desert, Illamurta, Charlotte Waters and Crown Point (Pavey & Woinarski 2006).</p> <p>Records: One record 25 km to the south of the ROW from 1993. Two records for Tennant Creek from 1901 & 1904.</p>	<p>MEDIUM (NT) / Not assessed (Qld)</p> <ul style="list-style-type: none"> Not federally-listed, therefore likelihood of occurrence in Qld has not been considered. A large area of the Project footprint in the NT contains suitable habitat. There is a recent record proximate to the construction ROW.
Common Brushtail Possum (Southern NT) <i>Trichosurus vulpecula vulpecula</i>	EN	-	<p>Habitat: In Central Australia, riverine habitat that is close to rocky outcrops and moist gullies within the ranges or rocky slopes (Kerle et al. 1992). Habitat occurs on various geological substrates but is characterised by a diverse association of fire-sensitive plant species (Pavey and Ward 2012).</p> <p>Distribution: Occurs in isolated populations in the southern NT. Most common in the southern NT within the MacDonald Ranges (Pavey and Ward 2012). Formerly had a much more extensive distribution in the NT.</p> <p>Records: Two records for Tennant Creek from 1968 are the nearest to the Project footprint.</p>	<p>NONE (NT) /Not assessed QLD</p> <ul style="list-style-type: none"> Not federally-listed, therefore likelihood of occurrence in Qld has not been considered. There is no suitable habitat within the Project footprint. There is no expert distribution mapping available. Apart from the records mentioned below, all other records are from a significant distance to the south and west of the Project footprint. The records from the rocky hills around Tennant Creek are historic records and range contraction indicates that the species is unlikely to still occur in these areas.

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
REPTILES				
Plains Death Adder <i>Acanthophis hawkei</i>	VU	VU	<p>Habitat: Floodplains and cracking soil plains (Webb et al. 2002).</p> <p>Distribution: Habitat mapping suggests the potential geographic range extends from western Qld, across the north of the NT to north-eastern Western Australia. Fragmented populations occur in the Mitchell Grass Downs of western Qld, the Barkly Tablelands on the NT/Qld border and east of Darwin in the NT (TSSC 2012).</p> <p>Records: Only one record from 1978 south of the Barkly Highway and north of the Project footprint. There are, however, many records in similar habitat to the north of the Barkly Highway.</p>	<p>HIGH (NT & Qld)</p> <ul style="list-style-type: none"> • There is suitable habitat within the Project footprint. • The Project footprint is within the <i>expert distribution (likely)</i> for the eastern half of the pipeline. • There is a record for this species proximate to, and in similar habitat to that within, the Project footprint.
Great Desert Skink <i>Liopholis kintorei</i>	VU	VU	<p>Habitat: Generally tall open shubland and hummock grasslands on red sandplains and sand ridges (Cogger et al. 1993; Pavey 2006d). However, in some locations (e.g. the Gibson Desert) found on sandplains with fine gravel.</p> <p>Distribution: Originally within a broad range extending from the desert parts of south-western NT, eastern interior of WA and north-western South Australia (Cogger et al. 1993). Currently known from seven populations (McAlpin 2001), three of which occur in the NT –the Tanami Desert, Uluru-Kata Tjuta National Park and the Yulara lease lands.</p> <p>Records: Two records near Tennant Creek from 1906 are the nearest to the Project footprint.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The current distribution of the species is confined to the western and southern NT. • The only records near the construction ROW are from 1906. • The Project footprint is within the <i>expert distribution (maybe)</i> at the Tennant Creek end of the pipeline.
Gulf Snapping Turtle <i>Eseya lavarackorum</i>	-	EN	<p>Habitat: Large rivers and their associated overflow lagoons and oxbow lakes (Cogger 2000; Woinarski 2006). Found in deeper permanent pools most often with muddy, sandy or rocky bottoms. Also found in the middle reaches of rivers, upstream of saline regions and downstream of escarpments, including plunge pools. Steep rocky gorges, and river reaches with intact river banks seem to be preferred habitats (Thomson et al. 1997).</p> <p>Distribution: From the Calvert River to the Nicholson River systems, including the Roper, Limmen Bight, Robinson and Nicholson Rivers all of which discharge into the Gulf of Carpentaria (Georges & Adams 1996; Thomson et al. 1997; Woinarski 2006).</p>	<p>NONE</p> <ul style="list-style-type: none"> • The Project footprint primarily lies in drainages flowing south away from the majority of river systems that this species uses. • There is no suitable habitat within the Project footprint. The only area where the Project footprint overlaps with potential habitat is the Leichardt River near Mount Isa. However, these upper reaches are upstream of where the river is dammed to form Lake Moondarra, and so have no connectivity with the Leichardt River downstream of the lake. • The Leichardt River section of the

THREATENED SPECIES LIKELIHOOD ANALYSIS				
Species	TPWC Act	EPBC Act	Species details	Likelihood of occurrence
			Records: None in the region.	Project footprint is within the <i>expert distribution</i> at the Mount Isa end, which is unusual because there are no records of the species within the Leichardt River. The closest records are from the Lawn Hill area approximately 200 km from the Project footprint.
SNAILS				
Spencer's Land Snail <i>Bothriembryon spenceri</i>	VU	-	Habitat: In leaf litter under fig trees and/or rocky areas. During unfavourable periods, buries in the soil (Wilson et al. 2006). Distribution: Restricted to the Krichauff and Chewings Ranges west of Alice Springs, notably occurring in Palm Valley (Solem 1988). Records: None proximate to the Project footprint.	NONE <ul style="list-style-type: none"> This species should not have come up in the NT Infonet search. This species has a very restricted range west of Alice Springs that is hundreds of kilometres to the south of the Project footprint.
PLANTS				
Tobermorey Melon <i>Austrobryonia argillicola</i>	VU	-	Habitat: Along creeks and poorly drained areas. Recorded from Bluebush swamps, Gidgee shrubland and <i>Eucalyptus camaldulensis</i> dominated riparian woodlands (Nano et al. 2012). Distribution: Endemic to central western Queensland extending to the adjoining Barkly Tablelands in the NT (Schaefer et al. 2008). Currently known from five locations within the NT (Nano et al. 2012). Records: Three records (one location) from 2001 approximately 15 km north of the Project footprint. The remaining records are at least 200 km south of the construction ROW.	HIGH (NT) / Not assessed (Qld) <ul style="list-style-type: none"> No longer federally-listed, therefore likelihood of occurrence in Qld has not been considered. There is suitable habitat within the Project footprint for this species, especially in the eastern area near the Qld border where there are numerous small ephemeral creeks and cracking clay soils, with some intermittent lakes. There is a record for this species proximate to the Project footprint and in similar habitat to that within the Project footprint.
Latz's Grass <i>Sporobolus latzii</i>	VU	-	Habitat: Only known to occur on clay soil at the edge of a seasonal swamp surrounded by <i>Eucalyptus coolabah</i> (Albrecht et al. 2012). Distribution: Endemic to the NT and currently only known from one site (Albrecht et al. 2012). Records: The only record ever of this species is approximately 4 km south of the Project footprint in the Wakaya Desert	HIGH (NT) / Not assessed (Qld) <ul style="list-style-type: none"> Not federally-listed, therefore likelihood of occurrence in Qld has not been considered. There is the potential for there to be suitable habitat within the Project footprint. There is a record for this species proximate to the Project footprint.

References used for the NGP Threatened Species Likelihood Analysis

- Albrecht, D, Latz, P & Westaway, J 2012, Threatened Species of the Northern Territory Information Sheet: *Sporobolus latzii* B.K. Simon (POACEAE), Department of Land Resource Management (DLRM).
http://lrm.nt.gov.au/_data/assets/pdf_file/0004/143176/Sporobolus_latzii_VU_FINAL.pdf.
- Aumann, T & Baker-Gabb, D 1991, 'A Management Plan for the Red Goshawk', *RAOU Report 75*, Royal Australasian Ornithologists Union, Melbourne.
- Barrett, G, Silcocks, A, Barry, S, Cunningham, R & Poulter, R 2003, *The New Atlas of Australian Birds*, Birds Australia, Melbourne, Victoria.
- Benshemesh, J & M Shulz 2008, 'Survey of the underground signs of marsupial moles in the WA Great Victoria Desert', *Tropicana Joint Venture and the Department of Natural Resources*, Environment and the Arts, NT Government.
- Blakers, M, Davies SJJF & Reilly PN, 1984, *The Atlas of Australian Birds*. Melbourne, Victoria: Melbourne University Press.
- Britton, PL, 1992, The Queensland Ornithological Society Bird Report, *Sunbird*, 22:51-83.
- Chatto, R 2003 'The distribution and status of shorebirds around the coast and coastal wetlands of the Northern Territory', *Technical Report 73*, Parks and Wildlife Commission of the Northern Territory, Darwin,
<http://www.nt.gov.au/nreta/publications/wildlife/science/pdf/2003_shorebirds_rpt76.pdf>
- Cogger, HG 2000, *Reptiles and Amphibians of Australia - 6th edition*, Reed New Holland, Sydney, NSW.
- Cogger, HC, Cameron, EE, Sadlier, RA & Eggler, P 1993, *The Action Plan for Australian Reptiles*, Australian Nature Conservancy Agency, Canberra.
- Debus, S & Czechura, G 1988, 'Field identification of the Red Goshawk *Erythrorchis radiatus*'. *Australian Bird Watcher*, vol. 12, pp. 154-159.
- Department of the Environment, 2016a, *Erythrorchis radiatus* in *Species Profile and Threats Database*, Department of the Environment, Canberra.
- Department of the Environment, 2016b, *Pezoporus occidentalis* in *Species Profile and Threats Database*, Department of the Environment, Canberra.
- Department of the Environment, 2016c, *Polytelis alexandrae* in *Species Profile and Threats Database*, Department of the Environment, Canberra.
- Department of the Environment, 2016d, *Calidris ferruginea* in *Species Profile and Threats Database*, Department of the Environment, Canberra.
- Dostine, P 1998, *Gouldian Finch recovery Plan (Erythrura gouldiae)*, Gouldian Finch Recovery Team and Parks & Wildlife Commission NT, Darwin.
- Franklin, DC 1999, Evidence of disarray amongst granivorous bird assemblages in the savannas of northern Australia, a region of sparse human settlement. *Biological Conservation*, 90, pp.53-68.
- Franklin, DC, Whitehead, PJ, Pardon, G, Matthews, J, McMahon, P & McIntyre, D 2005, 'Geographic patterns and correlates of the decline of granivorous birds in northern Australia', *Wildlife Research*, vol. 32, pp. 399-408.
- Garnett, ST, Szabo, JK & Dutton, G 2011, *The action plan for Australian Birds 2010*, CSIRO Publishing/Birds Australia, Melbourne, Victoria.
- Georges, A & Adams, M 1996, 'Electrophoretic delineation of species boundaries within the short-necked freshwater turtles of Australia (Testudines: Chelidae)', *Zoological Journal of the Linnean Society*, London, 118, pp.241-260.
- Higgins, PJ (ed.) 1999, *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 4: Parrots to Dollarbird, Oxford University Press, Melbourne, Victoria.
- Johnson, KA & Kerle, JA 1991, *Flora and vertebrate fauna of the Sir Edward Pellew group of islands, Northern Territory*, Report to the Australian Heritage Commission, Conservation Commission of the Northern Territory, Alice Springs, NT.
- Johnson, KA, 2008, 'Bilby *Macrotis lagotis*', In Van Dyck, S & Strahan R (eds), *The mammals of Australia*, Third edition, pp. 191-193, Reed New Holland, Sydney.
- Johnson KJ, Woinarski JCZ & Langford DJ 2008, Carpentarian Pseudantechinus *Pseudantechinus mimulus*, Van Dyck, S. & R. Strahan (eds.) *The Mammals of Australia*, pp. 71-72. New Holland Publishers, Sydney.
- Kerle, JA, Foulkes, JN, Kimber, RG & Papenfus, D 1992 'The decline of the brushtail possum, *Trichosurus vulpecula* (Kerr 1798), in arid Australia', *Rangelands Journal*, 14, pp.107-127.
- Kitchener, D 1991, 'Pseudantechinus mimulus (Thomas 1906) *Marsupalia: Dasyuridae*: rediscovery and redescription', *Records of the Western Australian Museum*, vol. 15, pp. 191-202.

References used for the NGP Threatened Species Likelihood Analysis

- Masters P, Dickman, CR, & Crowther, M 2003, 'Effects of cover reduction on mulgara *Dasyercus cristicauda* (Marsupialia: Dasyuridae), rodent and invertebrate populations in central Australia: implications for land management' *Austral Ecology*, 28, pp. 658-665.
- McAlpin, S 2001, *The Recovery Plan for the Great Desert Skink (Egernia kintorei) 2001-2011*, Arid Lands Environment Centre, viewed 20 Jan 2016, <<http://www.environment.gov.au/system/files/resources/2e5e895a-e176-409e-80c3-34d63a80fac5/files/great-desert-skink.pdf>>.
- Nano, C, Kerrigan, R & Albrecht, D, 2012, 'Threatened Species of the Northern Territory, *Austrobryonia argillicola*, I. Telford (CUCURBITACEAE)', Department of Land Resource Management, Northern Territory Government, viewed 20 Jan 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0007/353176/austrobryonia_argillicola_vu_v4.pdf>
- O'Malley, C 2006, 'National Recovery Plan for the Gouldian Finch (*Erythrura gouldiae*)', *WWF-Australia*, Sydney and Parks and Wildlife NT, Department of Natural Resources, Environment and the Arts, NT Government, Palmerston.
- Palmer, C, Woinarski, J & Hill, B 2012, 'Threatened Species of the Northern Territory- Golden Bandicoot *Isodon auratus*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0017/10817/golden_bandicoot_EN_FINAL.pdf>.
- Pavey, C 2006a, 'Threatened Species of the Northern Territory- Princess Parrot *Polytelis alexandrae*', Northern Territory Department of Land Resource Management, viewed 23 Jan 2016, <http://lrm.nt.gov.au/__data/assets/pdf_file/0020/10865/princess_parrot_vu.pdf>.
- Pavey, C 2006b, 'Threatened Species of the Northern Territory- Southern Marsupial Mole *Notoryctes typhlops*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://lrm.nt.gov.au/__data/assets/pdf_file/0013/10831/southern_marsupial_mole_vu.pdf>.
- Pavey, C 2006c, 'Threatened Species of the Northern Territory- Black-footed Rock-Wallaby *Petrogale lateralis*', Northern Territory Department of Land Resource Management, viewed 23 Jan 2016, <http://lrm.nt.gov.au/__data/assets/pdf_file/0015/10842/blackfooted_rockwallaby_nt.pdf>.
- Pavey, C, 2006d, 'Threatened Species of the Northern Territory, Great Desert Skink, Tjakura, *Egernia kintorei*', *Parks and Wildlife Commission Northern Territory*, viewed 20 Jan 2016, http://www.lrm.nt.gov.au/__data/assets/pdf_file/0007/10879/egernia_kintorei_vu.pdf.
- Pavey, C, Cole, J & Woinarski, JCZ 2006, 'Threatened Species of the Northern Territory- Brush-tailed mulgara *Dasyercus blythi*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://lrm.nt.gov.au/__data/assets/pdf_file/0016/10825/brushtailed_mulgara_vu.pdf>.
- Pavey & Ward 2012, 'Threatened Species of the Northern Territory- Common brushtail possum (Central Australian population) *Trichosurus vulpecula vulpecula*', Northern Territory Department of Land Resource Management, viewed 23 Jan 2016, <https://nt.gov.au/__data/assets/pdf_file/0019/205525/brushtail_possum_EN_FINAL.pdf>.
- Rogers, D 2001, 'Painted Snipe', *Wingspan*, vol. 11, no. 4, pp. 6-7.
- Schaefer H, Telford IRH & Renner SS 2008, 'Austrobryonia (Cucurbitaceae), a new Australian endemic genus, is the closest living relative to the Eurasian and Mediterranean Bryonia and Ecballium', *Systematic Botany*, 33(1), pp. 128-129.
- Solem, A 1988, 'Non-camaenid land snails of the Kimberley and Northern Territory, Australia. I. Systematics, affinities and ranges', *Invertebrate Taxonomy*, 2, 455- 604.
- Southgate RI 1990, Habitat and diet of the greater bilby *Macrotis lagotis* Reid (Marsupialia: Peramelidae), In JH Seebeck, PR Brown, RL Wallis, CM Kemper (eds), *Bandicoots and bilbies*, pp. 303-309, Surry Beatty & Sons, Sydney.
- Southgate R, Palmer C, Adams M, Masters P, Triggs B, & Woinarski J 1996, Population and habitat characteristics of the Golden Bandicoot (*Isodon auratus*) on Marchinbar Island, Northern Territory *Wildlife Research* 23, 647-664.
- Taylor, R, Woinarski, J, Charlie, A, Dixon, R, Pracy, D & Rhind, S 2004, 'Report on mammal survey of the Pellew Islands 2003', *Lianthawirriyarra Sea Ranger Unit*, Department of Infrastructure, Planning and Environment and Tropical Savannas CRC, Darwin, NT.
- Taylor, R, Chatto, R & Woinarski, JCZ 2013, 'Threatened Species of the Northern Territory- Australian painted snipe *Rostratula australis*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0003/10866/paintedsnipe_vu.pdf>.
- Thomson SA, White A & Georges A 1997, Re-evaluation of *Emydura lavarackorum*: identification of a living fossil,

References used for the NGP Threatened Species Likelihood Analysis

- Memoirs of the Queensland Museum*, 4291), pp 327-336.
- Threatened Species Scientific Committee (TSSC), 2015, Approved Conservation Advice for *Grantiella picta* (Painted Honeyeater), Commonwealth of Australia.
- Threatened Species Scientific Committee (TSSC), 2012, Commonwealth Listing Advice on *Acanthophsis hawkei* (Plains Death Adder), [Conservation Advice]
- Tidemann, SC 1996, 'Causes of the decline of the Gouldian Finch *Erythrura gouldiae*', *Biological Conservation International*, vol. 6, pp. 49-61.
- Ward, S 2012a, 'Threatened Species of the Northern Territory- Grey Falcon : *Falco hypoleucos*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://lrm.nt.gov.au/__data/assets/pdf_file/0014/143114/Grey_falcon_VU_FINAL.pdf>.
- Ward, S 2012b, 'Threatened Species of the Northern Territory – Painted Honeyeater: *Grantiella picta*, *Northern Territory Department of Land Resource Management*, viewed 24 Jan 2016, <https://nt.gov.au/__data/assets/pdf_file/0020/206363/painted-honeyeater.pdf>.
- Webb, JK, Christian, KA & Fisher, P 2002, 'Fast growth and early maturation in a viviparous sit-and-wait predator, the northern death adder (*Acanthophsis praelongus*) from tropical Australia', *Journal of Herpetology*, vol. 36, no. 3, pp. 505-509.
- Whitlock, F L 1924 'Journey to central Australia in search of the night parrot', *Emu* 23, pp. 248-281.
- Wilson, C, Woinarski, J, Kessner, V & Braby, M 2006, 'Threatened Species of the Northern Territory, Spencers Land Snail, *Bothriembryon spenceri*', *Northern Territory Parks and Wildlife Commission*, viewed 10 Feb 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0015/10914/Bothriembryon_spenceri_VU.pdf>
- Woinarski, JCZ 2004, 'National Multi-species Recovery Plan for the Carpentarian Antechinus *Pseudantechinus mimulus*, Butler's Dunnart *Sminthopsis butleri* and Northern Hopping-mouse *Notomys aquilo*, 2004 – 2009', *Northern Territory Department of Infrastructure Planning and Environment*, Darwin, viewed 20 Jan 2016, <<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/p-mimulus-s-butleri-n-aquilo/pubs/p-mimulus-s-butleri-n-aquilo.pdf>>.
- Woinarski J 2006, 'Threatened Species of the Northern Territory, Gulf Snapping Turtle, *Eseya lavarackorum*', *Northern Territory Parks and Wildlife Commission*, viewed 18 Jan 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0003/10884/gulf_snapping_turtle_lc.pdf>
- Woinarski, JCZ & Ward, S 2006, 'Threatened Species of the Northern Territory-Masked Owl (north Australian mainland subspecies) *Tyto novaehollandiae kimberli*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://www.nretas.nt.gov.au/__data/assets/pdf_file/0020/10856/masked_owl_tiw_i_en.pdf>.
- Woinarski, JCZ & Ward, S 2012, 'Threatened Species of the Northern Territory-Carpentarian Antechinus *Pseudantechinus mimulus*', *Northern Territory Department of Land Resource Management*, viewed 20 Jan 2016, <http://www.lrm.nt.gov.au/__data/assets/pdf_file/0011/10820/Carpentarian-antechinus_NT_FINAL.pdf>.
- Woolley PA 2008, Brush-tailed Mulgara *Dasyercus blythi*, in Van Dyck, S & Strahan R (eds), *The mammals of Australia*, Third edition, pp. 191-193, Reed New Holland, Sydney.

Appendix F

***@Unfj; fUgg\ abitat descriptions oZsurvey sites

This page has been intentionally left blank

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL2



This photograph shows fire sensitive fringing vegetation

Site information

Landform: Depression; also other minor (indistinct when observed on ground) depressions in area not selected as part of survey site.

Survey type: Aerial and ground checked.

Area: 0.57 ha

Project footprint: 191 m north of ROW (KP 223)

Swamp edge vegetation: *Ventilago viminalis*, *Eragrostis* sp., *Aristida* sp., *Gossypium* sp., *Eremophila longifolia*.

Fire history: Last burnt in 2011 (NAFI); evidence of fire-sensitive flora species suggests low fire impact.

Surface water: Not present.

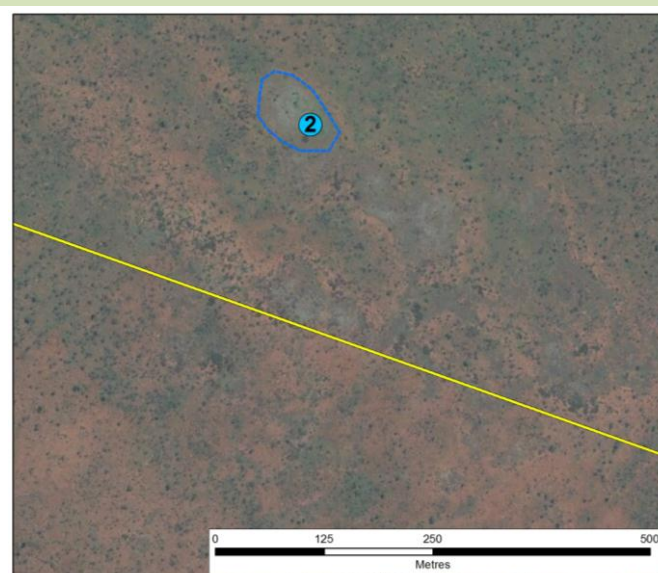
Cattle impact: None

Evidence of weeds / other impacts: Not observed

Surrounding landform (s): Minor depressions; desert sandplains dominated by hummock grasslands and Acacia shrubs (Turpentine)

Suitability assessment: None observed; low altitude fly over did not observe any patches of *Sporobolus* sp. grass; low habitat suitability due to lack of clay loam soils; no Coolabah trees observed.

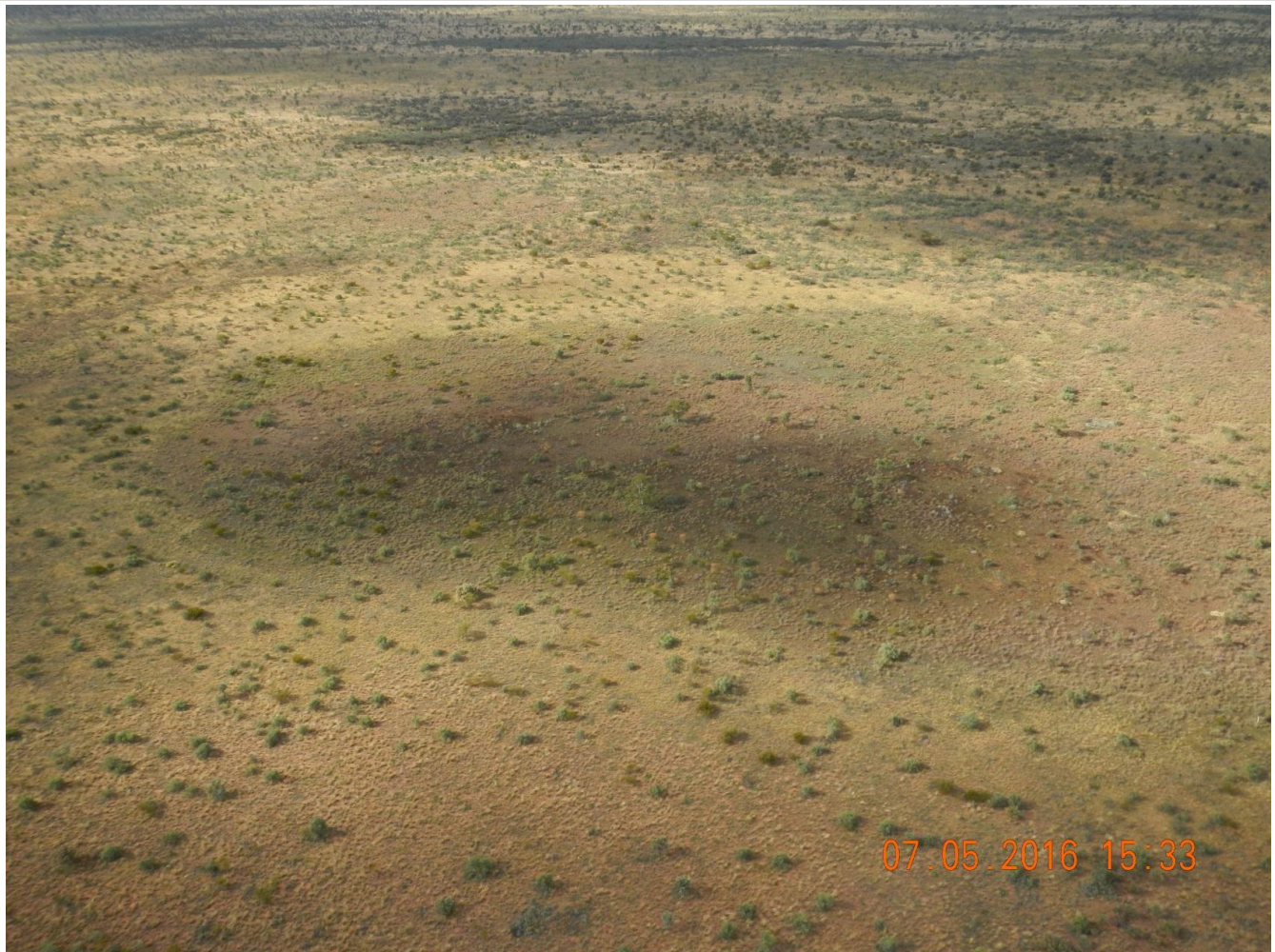
Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

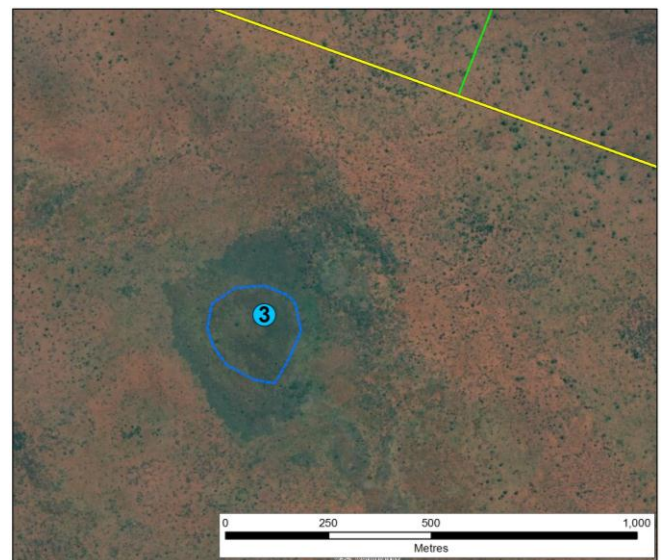
Site name: SL3



Site information

Landform: Claypan / seasonal swamp
Survey type: Aerial survey
Area: 3.9 ha (claypan looks larger in aerial image when observed during survey)
Project footprint: 581 m south of ROW (KP 238)
Swamp edge vegetation: *Eucalyptus coolabah* (uncommon), *Eucalyptus pachyphylla*, *Acacia* shrubs, *Melaleuca glomerata*, *Aristida sp.*, *Eragrostis sp.*, sedges observed within swamp
Fire history: Last burnt in 2011 (NAFI); fire impacted Coolabah present (malleed trees).
Surface water: Not present; clay soils appear wet.
Cattle impact: None
Evidence of weeds / other impacts: Not observed
Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs (Turpentine)
Suitability assessment: No ground search; low altitude fly over did not observe any patches of *Sporobolus sp.* grass; marginal habitat due to presence of fire impacted Coolabah; no chance of impact if present due to considerable distance from Project footprint.

Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary; Green line = proposed access track

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL4



Site information

Landform: Claypan / seasonal swamp

Survey type: Aerial survey

Area: 3.7 ha

Project footprint: 1 200 m north of ROW (KP 237); 1 250 m west of proposed access road.

Swamp edge vegetation: *Eucalyptus coolabah*, *Eucalyptus pachyphylla*, *Acacia* shrubs, *Aristida* sp., *Eragrostis* sp., sedges observed within swamp

Fire history: Last burnt in 2011 (NAFI); some fire impacted Coolabah present (malleed trees) and some non-fire impact Coolabah (single trunk) in centre of swamp.

Surface water: Not present. Swamp contained water in March 2016 when observed during recon survey.

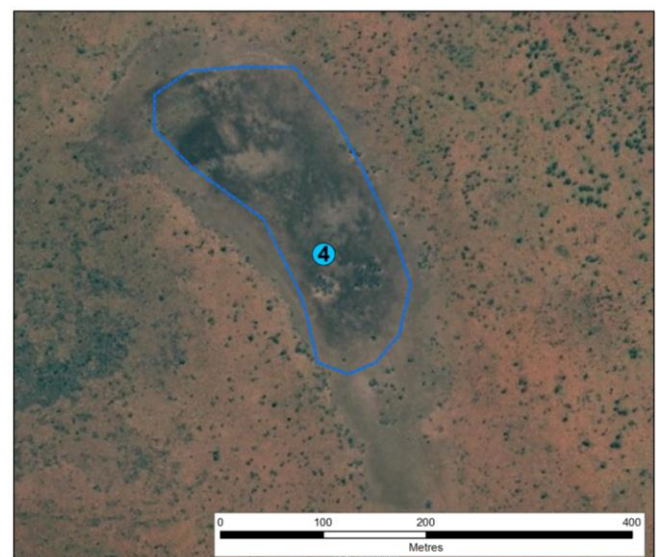
Cattle impact: None

Evidence of weeds / other impacts: Not observed; Buffel Grass in local area.

Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs

Suitability assessment: No ground search; low altitude fly over did not observe any patches of *Sporobolus* sp. grass; moderate habitat suitability due to presence of fire impacted and non-fire impacted Coolabah; low chance of impact if present due to distance from Project footprint.

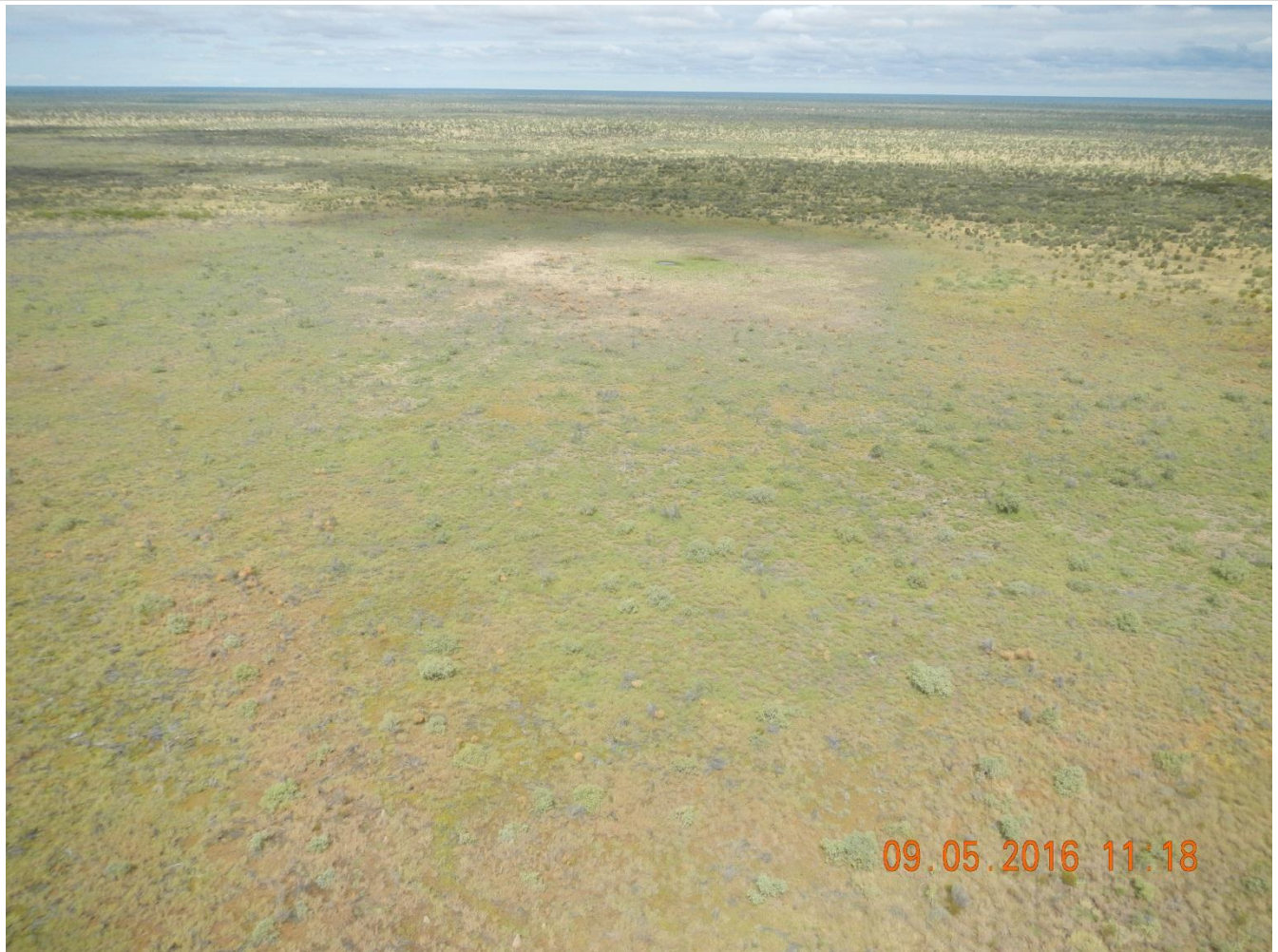
Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary; Green line = proposed access track

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL5



Site information

Landform: Claypan / seasonal swamp; surrounded by depression

Survey type: Aerial and ground survey

Area: 5.2 ha

Project footprint: 400 m south of ROW (KP 242); however, swamp edge habitat is extensive and pass within 100 m of ROW.

Swamp edge vegetation: *Eucalyptus coolabah* (all malleed), *Melaleuca glomerata*, *Eucalyptus pachyphylla*, *Acacia* shrubs, *Eulalia aurea*, *Triodia* sp., *Fimbristylis* sp, *Aristida* sp., *Eragrostis* sp., sedges dominant in swamp

Fire history: Last burnt in 2011 (NAFI); fire impacted vegetation present (i.e. malleed Coolabah trees)

Surface water: Present; small pool (10 x 10 m).

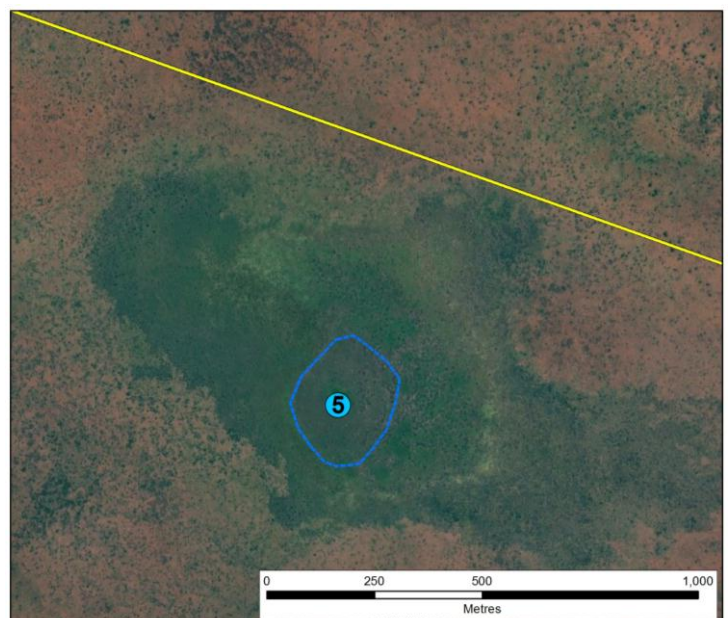
Cattle impact: None

Evidence of weeds / other impacts: Not observed; Buffel Grass in local area.

Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs

Suitability assessment: None observed during ground searches; low habitat suitability due to presence of fire impacted vegetation.

Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary (*note: ROW has since been moved north to avoid temporary swamp*).

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL6



Site information

Landform: Sinkhole

Survey type: Aerial and ground survey

Area: 0.11 ha

Project footprint: 15 m north of ROW (KP 257)

Swamp edge vegetation: Not applicable

Fire history: Area last burnt in 2011 (NAFI); sinkhole vegetation has low fire frequency.

Surface water: Not present.

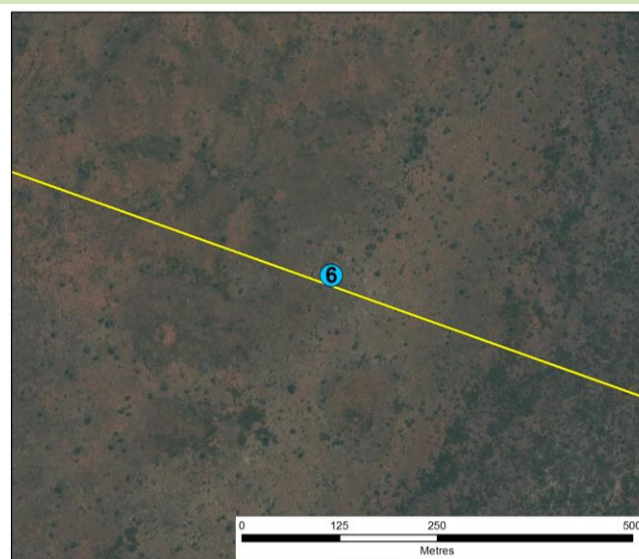
Cattle impact: None

Evidence of weeds / other impacts: Not observed

Surrounding landform (s): Desert sandplains dominated by hummock grasslands and Acacia shrubs

Suitability assessment: None observed during ground searches; not suitable habitat.

Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary; Green line = proposed access track

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL7



Site information

Landform: Depression (no clay soils present)

Survey type: Aerial and ground survey

Area: 0.26 ha

Project footprint: 15 m north of ROW (KP 269)

Swamp edge vegetation: *Melaleuca glomerata*, *Hakea* sp., *Eucalyptus pachyphylla*, *Aristida* sp. *Gossypium* sp., *Acacia* shrubs, tussock grasses, *Triodia* sp. (*Spinifex*) relatively uncommon.

Fire history: Area last burnt in 2011 (NAFI); previous burn in 2007.

Surface water: Not present

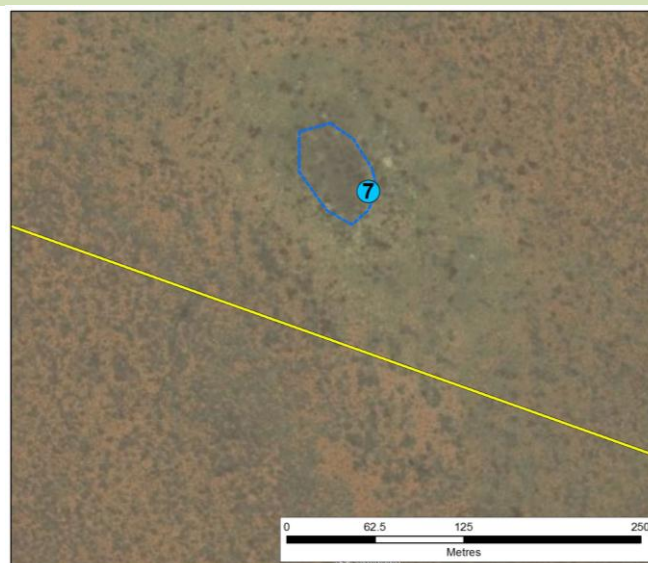
Cattle impact: None

Evidence of weeds / other impacts: Not observed

Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs

Suitability assessment: None observed during ground searches; not suitable habitat.

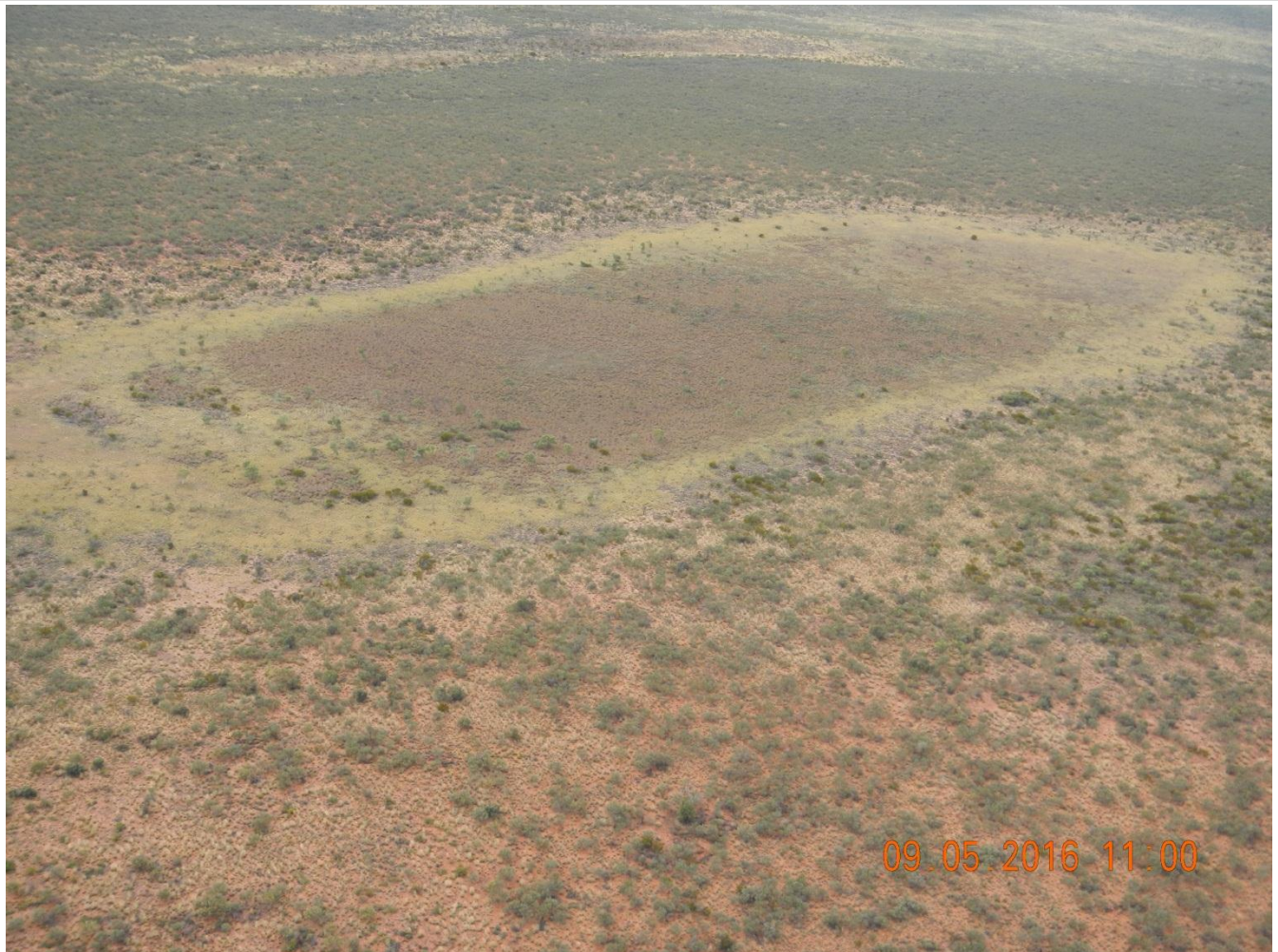
Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary; Green line = proposed access track

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

Site name: SL8



Site information

Landform: Claypan / seasonal swamp

Survey type: Aerial survey

Area: 8.26 ha

Project footprint: 798 m north of ROW (KP 268)

Swamp edge vegetation: *Eucalyptus coolabah*, *Melaleuca glomerata*, *Eucalyptus pachyphylla*, *Eulalia aurea*, *Aristida* sp. *Acacia* shrubs, tussock grasses, *Triodia* sp. (*Spinifex*) relatively uncommon.

Fire history: Area last burnt in 2011 (NAFI); presence of large Coolabah and malleed Coolabah indicates moderate long term fire impact on edge of swamp.

Surface water: Not present

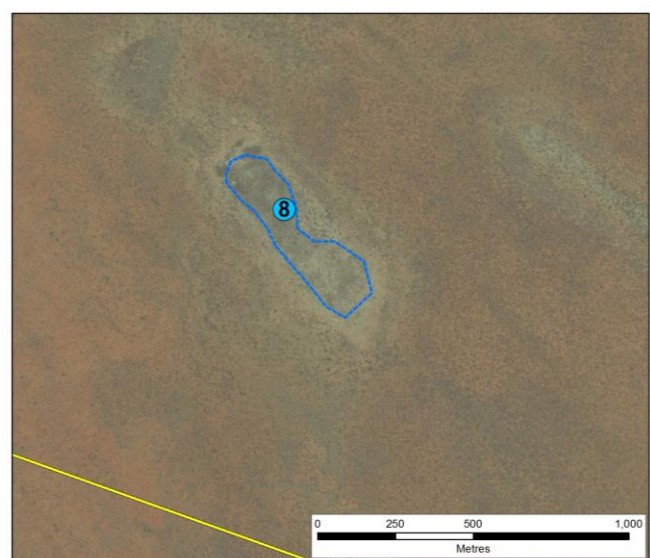
Cattle impact: None

Evidence of weeds / other impacts: Not observed

Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs

Suitability assessment: No ground search; low altitude fly over did not observe any patches of *Sporobolus* sp. grass; moderate habitat suitability due to presence of fire impacted and non-fire impacted Coolabah; low chance of impact if present due to distance from Project footprint.

Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary

Latz's Grass (*Sporobolus latzii*) site descriptions, May 2016

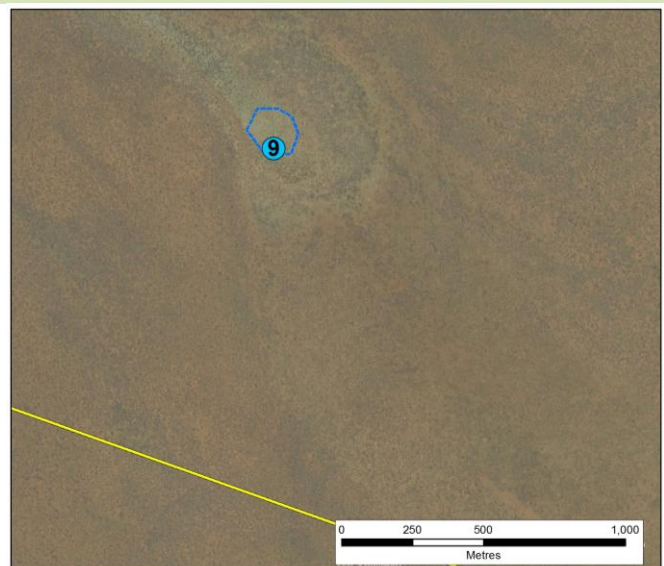
Site name: SL9



Site information

Landform: Minor swamp / depression (considered as transition due to the presence of Coolabah trees)
Survey type: Aerial survey
Area: 2.2 ha
Project footprint: 1 052 m north of ROW (KP 270)
Swamp edge vegetation: *Eucalyptus coolabah*, *Aristida* sp. *Acacia* shrubs, *Eulalia aurea*, tussock grasses
Fire history: Area last burnt in 2011 (NAFI).
Surface water: Not present
Cattle impact: None
Evidence of weeds / other impacts: Not observed
Surrounding landform (s): Desert sandplains dominated by hummock grasslands and *Acacia* shrubs
Suitability assessment: No ground search; low altitude fly over did not observe any patches of *Sporobolus* sp. grass; low chance of impact if present due to distance from Project footprint.

Reference map (refer to site map for location)



Map key: Yellow line = ROW; Blue circle = survey site; Blue line = depression boundary

Appendix G

****HcVYfa cfYmAYcb habitat descriptions of ROW survey sites

This page has been intentionally left blank

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA01



Site description details

Survey: Aerial and ground

Landform: Minor drainage

Vegetation: *Astrebla* sp. (likely *pectinata*) grassland

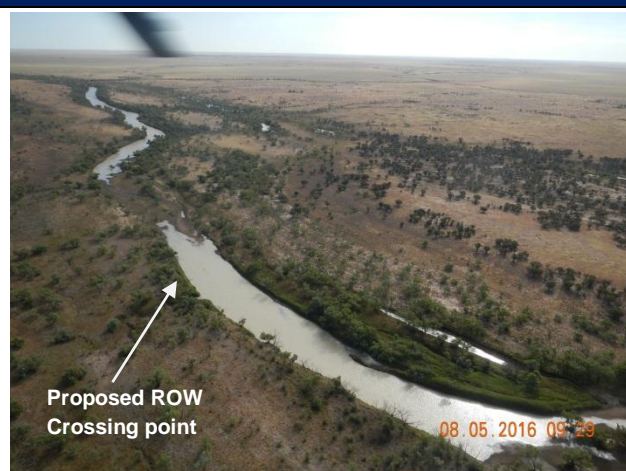
Soil: Gravel survey over heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; marginal habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA02 (Ranken River)



Site description details

Survey: Aerial and ground

Landform: River (Ranken River)

Vegetation: Coolabah (*Eucalyptus microtheca*) line the creek banks (low open woodland), Noogoora Burr (*Xanthium strumarium*), *Astrebla pectinata*, *Enteropogon acicularis*, numerous herbs and forbs.

Soil: Heavy clay

Surface water present: Yes, large pool

***Austrobryonia argillicola* assessment:** Present in low numbers; 2 small plants identified on upper bank of river (vouchered); foliage present but dry; fruit present and conspicuous; suitable habitat.

Notes: Declared weed present in high densities – Noogoora Burr (*Xanthium strumarium*); Cattle impact (erosion, trampling); no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA03



Site description details

Survey: Aerial and ground

Landform: Floodout; relic channel; depression

Vegetation: Coolabah (*Eucalyptus microtheca*) and Gidyea (*Acacia georginae*) low open woodland, *Astrebla sp.*, *Aristida sp.*, numerous herbs and forbs.

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** Present in low numbers; 1 small plant identified on upper bank of river (not vouchered); occur on clay soils; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA04



Site description details

Survey: Aerial and ground

Landform: Drainage

Vegetation: Mimosa Bush (*Vachellia farnesiana*) open shrubland, *Eulalia aurea*, *Dichanthium fecundum*, *Astrebla pectinata*, plus other annual grasses, herbs and forbs

Soil: Heavy clay loam

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA05



Site description details

Survey: Aerial and ground

Landform: Minor drainage

Vegetation: Grassland of *Eulalia aurea*, *Dichanthium fecundum*, *Astrebla pectinata*, plus other annual grasses, herbs and forbs with sparse Mimosa Bush (*Vachellia farnesiana*) shrubs

Soil: Clay

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA06



Site description details

Survey: Aerial

Landform: Drainage

Vegetation: Grassland of *Eulalia aurea*, *Dichanthium fecundum*, *Astrebla pectinata*, plus other annual grasses, herbs and forbs

Soil: Clay

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA07



Site description details

Survey: Aerial

Landform: Minor drainage

Vegetation: Grassland of *Eulalia aurea*, *Astrebla pectinata*

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA08



Site description details

Survey: Aerial and ground

Landform: Depression

Vegetation: Coolabah (*Eucalyptus microtheca*) low open to sparse woodland, plus *Excoecaria parvifolia*, *Muehlenbeckia florulenta*, *Astrebla sp.*, numerous herbs and forbs.

Soil: Heavy clay; cracking; surface rock / gravel.

Surface water present: No

***Austrobryonia argillicola* assessment:** Present in low numbers; 2 small plants identified on open clay soils (vouchered); foliage dry; fruit present and conspicuous; suitable habitat.

Notes: Cattle impact (erosion, trampling); no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA09



Site description details

Survey: Aerial and ground

Landform: River

Vegetation: Coolabah (*Eucalyptus microtheca*) and low open woodland, *Astrebla* sp., numerous herbs and forbs.

Soil: Heavy clay

Surface water present: Yes, large pool

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; heavily grazed; no existing tracks / fences

Site: AA10



Site description details

Survey: Aerial and ground

Landform: Drainage

Vegetation: Small Coolabah (*Eucalyptus microtheca*) low sparse woodland, *Astrebla* sp., numerous herbs and forbs.

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** Present in low numbers; 3 small plants identified on clay soils; foliage dry; fruit present and conspicuous; suitable habitat.

Notes: Cattle disturbance; heavily grazed; no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA11



Site description details

Survey: Aerial and ground

Landform: Drainage

Vegetation: Sparse shrubland (species not identified) over *Astrebla pectinata* grassland, annual grasses

Soil: Heavy clay loam

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; heavily grazed; no existing tracks / fences

Site: AA12



Site description details

Survey: Aerial

Landform: Drainage

Vegetation: Sparse shrubland (species not identified) over *Astrebla pectinata* grassland, annual grasses

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; suitable habitat.

Notes: Cattle disturbance; heavily grazed; existing tracks present near crossing site

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA13



Site description details

Survey: Aerial and ground

Landform: Drainage

Vegetation: Mimosa Bush (*Vachellia farnesiana*)
open shrubland over *Astrelba pectinata* grassland,
annual grasses

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** Present in low numbers on clay soils (not vouchered); foliage absent; fruit present and observed hanging in the base of shrubs; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA14



Site description details

Survey: Aerial

Landform: Depression

Vegetation: Bluebush (*Chenopodium auricomum*)
low open shrubland, with *Astrelba pectinata*,
Dichanthium fecundum, *Eulalia aurea*.

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** Suitable habitat

Notes: Cattle disturbance; no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA15



Site description details

Survey: Aerial and ground

Landform: River

Vegetation: Coolabah (*Eucalyptus microtheca*) low open woodland, *Astrebla sp.*, numerous herbs and forbs.

Soil: Heavy clay; calcrete outcrop on floodout area

Surface water present: Yes

***Austrobryonia argillicola* assessment:** None observed; upper banks and floodout areas where checked; suitable habitat.

Notes: Cattle disturbance; heavily grazed; existing tracks present near crossing site

Site: AA16



Site description details

Survey: Aerial and ground

Landform: Drainage

Vegetation: Lignum (*Muehlenbeckia florulenta*) low open shrubland, with *Astrebla pectinata*, *Dichanthium fecundum*, *Eulalia aurea*, annual herbs and forbs.

Soil: Heavy clay

Surface water present: No

***Austrobryonia argillicola* assessment:** Present in low numbers on clay soils; 2 x relatively large specimens observed (vouchered); green foliage present; fruit present and conspicuous; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Tobermorey Melon (*Austrobryonia argillicola*) ROW survey sites, May 2016

Site: AA17



Site description details

Survey: Aerial and ground

Landform: Floodout; relic channel; depression

Vegetation: Coolabah (*Eucalyptus microtheca*) low open woodland, Lignum (*Muehlenbeckia florulenta*), Bluebush (*Chenopodium auricomum*), *Sporobolus sp.*, *Astrebula pectinata*, numerous herbs and forbs.

Soil: Heavy clay

Surface water present: Yes; upstream ~100 m

***Austrobryonia argillicola* assessment:** Present in low numbers on open clay soils; 1 x specimens observed (not vouchered); green foliage present; fruit present and conspicuous; suitable habitat.

Notes: Cattle disturbance; no existing tracks / fences

Site: AA18



Site description details

Survey: Aerial

Landform: Floodout; relic channel; depression

Vegetation: Coolabah (*Eucalyptus microtheca*) low open woodland, *Astrebula sp.*, numerous herbs and forbs.

Soil: Heavy clay; calcrete outcrop / surface rocks

Surface water present: No

***Austrobryonia argillicola* assessment:** None observed; upper banks and floodout areas where checked; suitable habitat.

Notes: Cattle disturbance; heavily grazed; no existing tracks / fence lines

This page has been intentionally left blank

Appendix H

****HcVYfa cfYmiAYcb'habitat descriptions of access track
survey sites

This page has been intentionally left blank

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA19 (western access track)



Landform: Depression
A. argillicola habitat assessment: Suitable

Site: AA20 (western access track)



Landform: Claypan
A. argillicola habitat assessment: Suitable

Site: AA21 (western access track)



Landform: Drainage
A. argillicola habitat assessment: Suitable

Site: AA22 (western access track)



Landform: Small drainage
A. argillicola habitat assessment: Suitable

Site: AA23 (western access track)



Landform: Drainage
A. argillicola habitat assessment: Suitable

Site: AA24 (western access track)



Landform: Small drainage
A. argillicola habitat assessment: Suitable

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA25 (western access track)



Landform: Edge of soak / depression
***A. argillicola* habitat assessment:** Suitable

Site: AA26 (western access track)



Landform: Small drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA27 (western access track)



Landform: Claypan
***A. argillicola* habitat assessment:** Marginal

Site: AA28 (western access track)



Landform: Creek
***A. argillicola* habitat assessment:** Suitable

Site: AA29 (western access track)



Landform: Creek
***A. argillicola* habitat assessment:** Suitable (banks)

Site: AA30 (central access track)



Landform: Depression
***A. argillicola* habitat assessment:** Suitable

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA37 (central access track)



Landform: Small drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA38 (central access track)



Landform: Depression
***A. argillicola* habitat assessment:** Suitable

Site: AA39 (central access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA40 (central access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA41 (central access track)



Landform: Creek
***A. argillicola* habitat assessment:** Suitable

Site: AA42 (central access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA49 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA50 (eastern access track)



Landform: Small drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA51 (eastern access track)



Landform: Small drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA52 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA53 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA54 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA61 (eastern access track)



Landform: Claypan
***A. argillicola* habitat assessment:** Suitable

Site: AA62 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA63 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA64 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Site: AA65 (eastern access track)



Landform: Depression
***A. argillicola* habitat assessment:** Suitable

Site: AA66 (eastern access track)



Landform: Drainage
***A. argillicola* habitat assessment:** Suitable

Tobermorey Melon (*Austrobryonia argillicola*) access track survey site descriptions, May 2016

Site: AA67 (eastern access track)

Site: AA68 (eastern access track)



Landform: Drainage

***A. argillicola* habitat assessment:** Suitable



Landform: Drainage

***A. argillicola* habitat assessment:** Suitable


This page has been intentionally left blank

Appendix I




Carpentarian Antechinus habitat descriptions of survey sites

This page has been intentionally left blank

Carpentarian Antechinus (*Pseudantechinus mimulus*) survey site descriptions, May 2016

	<p>Site name: CA 1</p>	<p>Land form: Rocky ridge line</p>
<p>Site 1 – facing north</p>	<p>Vegetation: Low open woodland with hummock grass understorey (RE1.11.2a/1.11.2d). Dominant species – <i>Eucalyptus leucophloia</i> over <i>Triodia</i> spp. Patchy shrub layer present with <i>Acacia monticola</i> and <i>Jacksonia vernicosa</i>. Well vegetated drainage line with large <i>E. camaldulensis</i> at base of slope.</p> <p>Fire history: Appeared burnt recently. Mostly immature <i>Triodia</i> hummocks present throughout.</p> <p>Landform description: West facing slope and ridgeline within rocky range running in north-south direction. Two trapping transects located on midslope and upper slope/ridgeline. Loose scree (cobble sized) throughout with scattered protruding rock formations along ridge, siltstone and metamorphic rocks present, little evidence of crevice formation, immature spinifex cover (> 30 %) throughout with some bare areas in steep sections.</p> <p>Trapping results: Carpentarian Antechinus (<i>Pseudantechinus mimulus</i>) and Common Rock Rat (<i>Zyromys argurus</i>).</p> <p>Fauna habitat observations: Relatively diverse avian fauna present due to downslope presence of drainage line. Evidently suitable habitat for small ground mammal fauna despite lack of ground cover.</p>	
	<p>Site name: CA 2</p>	<p>Land form: Rocky valley</p>
<p>Site 2 - facing east side of valley</p>	<p>Vegetation: Low open woodland with hummock grass understorey (RE1.11.2a). Dominant species – sparse <i>Eucalyptus leucophloia</i> over <i>Triodia</i> spp. Very sparse shrub layer on slopes. Well vegetated minor drainage line at base of valley.</p> <p>Fire history: Appeared burnt recently (< 1 year). Only very immature <i>Triodia</i> hummocks present throughout.</p> <p>Landform description: Valley within rocky range running in north-south direction. Two trapping transects located midslope on either side (east and west) of valley. Loose scree (cobble sized) throughout with scattered protruding rock formations particularly on west slope where some evidence of minor crevice formation, siltstone and metamorphic rocks present, immature spinifex cover (> 20 %) throughout.</p> <p>Trapping results: Carpentarian Antechinus (<i>Pseudantechinus mimulus</i>) and Desert Mouse (<i>Pseudomys desertor</i>).</p> <p>Fauna habitat observations: Few birds present at any stage although grasswrens observed on two occasions. Evidently suitable habitat for small ground mammal fauna and reptiles (Ring-tailed Dragon <i>Ctenophorus caudicinctus</i> observed) despite lack of ground cover.</p>	
	<p>Site name: CA 3</p>	<p>Land form: Boulder pile on low ridge line</p>
<p>Site 3 - facing west</p>	<p>Vegetation: Low open woodland with hummock grass understorey (RE1.12.1). Dominant species – sparse <i>Eucalyptus leucophloia</i> over <i>Triodia</i> spp.</p> <p>Fire history: Appeared burnt relatively recently (between 1-2 years). Mostly immature <i>Triodia</i> hummocks present. Sparse low shrub layer regenerating away from trapping area (boulder pile).</p> <p>Landform description: East facing slope and ridgeline within low rocky undulating hill country. Two trapping transects located on lower slope and midslope. Large boulders throughout (igneous rocks present). Extensive crevice and small cave formation, immature spinifex cover – approx. 40 % off slope and less coverage on boulder pile sections.</p> <p>Trapping results: No animals captured.</p> <p>Fauna habitat observations: Limited fauna observations available at this site with few birds present at any stage. Appeared abundant suitable shelter habitat for a range of fauna including microbats, rock-wallaby, and small mammals/reptiles. However only Wallaroo <i>Macropus robustus</i> and Ring-tailed Dragon observed.</p>	

Carpentarian Antechinus (*Pseudantechinus mimulus*) survey site descriptions, May 2016

 <p>Site 4 - facing south-west along transect</p>	<p>Site name: CA 4</p> <p>Land form: Boulder piles on ridge line</p> <p>Vegetation: Open woodland with hummock/tussock grass understory (RE1.11.3). Dominant species – <i>Eucalyptus leucophylla</i> and <i>Corymbia terminalis</i> over <i>Triodia spp</i> and exotic Annual Mission Grass <i>Pennisetum pedicellatum</i>. Adjacent to drainage line lined by <i>Melaleuca bracteata</i> and small <i>E. camaldulensis</i>.</p> <p>Fire history: > 2 years, some mature <i>Triodia</i> hummocks present in scattered areas around boulder piles.</p> <p>Landform description: Twin boulder piles within low rocky undulating hill country uphill from sandy drainage line. Two trapping transects located on twin boulder piles. Large boulders throughout (igneous rocks present). Extensive crevice formation and small cave formation. Mixture of spinifex, native tussock grasses and exotic Annual Mission Grass provide extensive cover although impacted by cattle (approx. 50-60% coverage).</p> <p>Trapping results: Sandy Inland Mouse <i>Pseudomys hermannsburgensis</i> and Common Rock Rat.</p> <p>Fauna habitat observations: Relatively diverse avian assemblage, due to presence of creekline habitat. Suitable shelter habitat for a range of fauna including microbats, small mammals/reptiles and Purple-necked Rock-wallaby <i>Petrogale purpureicollis</i> observed nearby. Wallaroo, Ring-tailed Dragon and Spiny-tailed Monitor <i>Varanus acanthurus</i> observed.</p>
 <p>Site 5 - facing west to ridgeline</p>	<p>Site name: CA 5</p> <p>Land form: Rocky ridge line</p> <p>Vegetation: Low open woodland with hummock grass understory (RE1.11.2a). Dominant species – sparse <i>Eucalyptus leucophloia</i> over <i>Triodia spp</i>. Very sparse shrub layer.</p> <p>Fire history: > 2 years, appears long unburnt on upper slope where mature <i>Triodia</i> hummocks present.</p> <p>Landform description: Single trapping transect located on upper slope (near ridgeline), slope east facing, loose metamorphic rocks (cobble sized) on mid and lower slope type, more extensive rock formations on upper slope with limited evidence of crevice/cave formation, mature spinifex cover (> 50 %) particularly on upper slope.</p> <p>Trapping results: No animals captured.</p> <p>Fauna habitat observations: Site located uphill from Diamantina Development Road. Limited fauna observations available at this site with few birds present at any stage. Suitable habitat for small ground mammal fauna and reptiles.</p>
 <p>Site 6 - facing south</p>	<p>Site name: CA 6</p> <p>Land form: Rocky ridge line</p> <p>Vegetation: Low open woodland with hummock grass understory (RE1.11.2a). Dominant species – sparse <i>Eucalyptus leucophloia</i> and <i>Corymbia terminalis</i> over <i>Triodia spp</i>. Patchy shrub layer on lower slopes. Located uphill from well vegetated alluvial flat area.</p> <p>Fire history: Appeared burnt relatively recently (between 1-2 years). Mostly immature <i>Triodia</i> hummocks present.</p> <p>Landform description: Northern end of ridgeline within isolated low rocky range running in north-south direction. Camera trapping only located on upper slope. Loose metamorphic rocks (cobble sized) on mid and lower slope type, more extensive rock formations on upper slope and ridgeline. Limited crevice and cave formations present, largely immature spinifex cover (approx. 40 %) throughout.</p> <p>Trapping results:</p> <p>Fauna habitat observations: Limited fauna observations carried out at site. Avian fauna likely to be bolstered by more vegetated adjacent alluvial flats. Suitable habitat for small ground mammal fauna, microbats and reptiles.</p>

Appendix J

.....Greater Bilby habitat descriptions of track-plot sites

This page has been intentionally left blank

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016



Site name: TP 01

Land form: Loamy sand plain

Site class: Habitat

Vegetation: Low open woodland with tussock grass understorey (grazed). Dominant species – *Acacia aneura* (5%), *Eucalyptus brevifolia* (1%), *Hakea arborescens* (1%), *Aristida sp.* (10 – 15%).

Fire history: > 3 years

Habitat notes: Above ground termite mounds suggest a high water table - lowers suitability for Greater Bilby burrow; no food indicator plants present.

Tracking conditions: Average to poor; overnight light rain; slight shadow; 20% of track-plot contained soils suitable for tracking; high level of cattle trampling and grazing; heavy loam soils and recent rain reduce chance of tracking smaller animals.

Fauna signs:

- Large goanna – diggings, tracks; common; recent
- Small lizard – burrows; common; recent
- Australian Bustard – feather; uncommon; recent
- Cow – tracks, scats; abundant; recent



Site name: TP02

Land form: Loamy sand plain

Site class: Putative Greater Bilby

Vegetation: Low open woodland with hummock grass understorey. Dominant species – *Eucalyptus pachyphylla* (2%), *Eucalyptus brevifolia* (1%), *Acacia lysiphloia* (5%), *Triodia pungens* (45%).

Fire history: > 3 years

Habitat notes: Food indicator plant present (*A. lysiphloia*) in relatively high density (40 % cover).

Tracking conditions: Average; overnight light rain; slight shadow; 50% of track-plot contained soils suitable for tracking; high level of cattle trampling and grazing; loam soils and recent rain reduce chance of detecting smaller animal tracks; diggings burrows still obvious.

Fauna signs:

- Large goanna – burrow, digs, scat; common; recent
- Small lizard – burrows, sighted; *Ctenopus pantherinus*, *Ctenophorus nuchalis*; common; recent
- Large rodent – sighted; *Rattus villosissimus* (likely); uncommon; recent
- Red Kangaroo – track, scat; uncommon; old
- Cow – tracks, scats; abundant; recent



Site name: TP 03

Land form: Low rocky rise

Site class: Putative Greater Bilby

Vegetation: Low open woodland with hummock grass understorey. Dominant species – *Eucalyptus brevifolia* (5%), *Acacia hilliana* (40%); *Triodia sp.* (60%).

Fire history: > 3 years




Habitat notes: Food indicator plant present in high densities (*A. hilliana*); suitable substrate for burrow.

Tracking conditions: Poor; overnight light rain; no shadow; 20% of track-plot contained soils suitable for tracking; rocky soils and recent rain reduce chance of tracking smaller animals; burrows and diggings obvious.




Fauna signs:

- Large goanna – burrow; common; recent; *V. gouldii*
- Small goanna – burrow; uncommon; old.
- Small lizard – burrows, sighted; common; recent
- Little Button-quail – sighted (flushed); common; recent




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>02_05_2016_14_26</p>	<p>Site name: TP 04 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey (grazed). Dominant species – <i>Acacia aneura</i> (5%), <i>Triodia sp.</i> (25%), annual grasses (10%). <i>Yakirra australiensis</i> was observed in low densities.</p> <p>Fire history: > 3 years, long unburnt</p> <p>Habitat notes: Above ground termite mounds suggest a high water table - lowers suitability for Greater Bilby burrow; <i>Yakirra australiensis</i> was observed.</p> <p>Tracking conditions: Average to poor; overnight light rain; no shadow; 30% of track-plot contained soils suitable for tracking; high level of cattle trampling and grazing; heavy loam soils and recent rain reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow with large spoil; uncommon; relatively recent; <i>V. gouldii</i> • Cow – tracks, scats; abundant; recent
 <p>02_05_2016_14_47</p>	<p>Site name: TP 05 Land form: Sand plain</p> <p>Site class: Habitat</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Acacia coriacea</i> (<5%), <i>Acacia lysiphloia</i> (30%), <i>Acacia adsurgens</i> (5%), <i>Triodia pungens</i> (60%)</p> <p>Fire history: > 3 years, long unburnt</p> <p>Habitat notes: Food indicator plant present (<i>A. lysiphloia</i>) in relatively high density (30 % cover).</p> <p>Tracking conditions: Good; overnight light rain; distinct shadow; 60% of track-plot contained soils suitable for tracking; low level of cattle trampling and grazing; some cryptogam crust present; sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small lizard – burrows; common; recent • Red Kangaroo – scat; uncommon; relatively recent • Cow – tracks, scats; abundant; recent
 <p>02_05_2016_15_03</p>	<p>Site name: TP 06 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus brevifolia</i>, <i>Acacia lysiphloia</i>, <i>Triodia pungens</i>,</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Food indicator plant present (<i>Senna notabilis</i>) (5 % cover, in burnt and disturbed area only).</p> <p>Tracking conditions: Average; overnight light rain; slight shadow; 50% of track-plot contained soils suitable for tracking; sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – tracks, burrow with large spoil; uncommon; recent; <i>V. gouldii</i>




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>02.05.2016 15:36</p>	<p>Site name: TP 07 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus gamophylla</i> (2%), <i>Triodia pungens</i> (50 – 60%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Nil</p> <p>Tracking conditions: Average; overnight light rain; slight shadow; 50% of track-plot contained soils suitable for tracking; loamy clay soils and recent rain reduce chance of detecting smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small lizard – diggings; common; recent • Red Kangaroo – scat; uncommon; relatively recent • Northern Nailtail Wallaby – scat; relatively common; relatively recent. • Cat – tracks; abundant; recent
 <p>02.05.2016 15:59</p>	<p>Site name: TP 08 Land form: Low rocky rise</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Low open woodland with hummock grass understorey (grazed). Dominant species – <i>Eucalyptus brevifolia</i> (2%), <i>Acacia ancistrocarpa</i> (5%), <i>Acacia hilliana</i> (10%), <i>Triodia sp.</i> (70%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Acacia hilliana</i>)</p> <p>Tracking conditions: Poor; overnight light rain; no shadow; 20% of track-plot contained soils suitable for tracking; high rock cover; loam soils with cryptogam curst present; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – diggings, uncommon; relatively recent; <i>V. gouldii</i> (likely). • Red Kangaroo – scat; uncommon; relatively recent
 <p>05.05.2016 09:29</p>	<p>Site name: TP 10 Land form: Sand plain</p> <p>Site class: Habitat</p> <p>Vegetation: Low open woodland with hummock grass understorey (grazed). Dominant species – <i>Eucalyptus sp.</i> (2%), <i>Acacia hilliana</i> (20%), <i>Triodia sp.</i> (40%) – patchy due to recent burn.</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Food indicator plant present (<i>Acacia hilliana</i>); recently burnt but no germination of <i>Yakirra australiensis</i> (post-fire ephemeral grass often targeted by Greater Bilby).</p> <p>Tracking conditions: Good; overnight light rain; slight shadow; 70% of track-plot contained soils suitable for tracking; moderate level of cattle trampling and grazing; sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Red Kangaroo – scat; common; recent • Small lizard – burrows; common; recent • Cow – tracks, scats; abundant; recent




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>03-05-2016 09:55</p>	<p>Site name: TP 11 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low sparse woodland with hummock grass understorey (grazed). Dominant species (% cover) – <i>Eucalyptus microtheca</i> (1%), <i>Acacia tenuissima</i> (3%), <i>Triodia pungens</i> (55%)</p> <p>Fire history: 2 years,</p> <p>Habitat notes: No food indicator plants recorded.</p> <p>Tracking conditions: Good; overnight light rain; slight shadow; 60% of track-plot contained soils suitable for tracking; high level of cattle; heavy loam soils and recent rain reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; uncommon; relatively recent; <i>V. gouldii</i> (likely). • Small goanna – burrow, diggings; relatively recent • Red Kangaroo – scat; common; recent • Small lizard – burrows; common; recent • Cow – tracks, scats; abundant; recent • Camel – tracks, scats; uncommon; old' • Red-chested Button-quail – seen; uncommon; recent
 <p>03-05-2016 10:24</p>	<p>Site name: TP 12 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus gamophylla</i>, <i>Triodia pungens</i> (60%), <i>Senna</i> sp. (2%), <i>Carissa lanceolata</i> (2%)</p> <p>Fire history: 2 years</p> <p>Habitat notes: No food indicator plants recorded.</p> <p>Tracking conditions: Average; overnight light rain; no shadow; 50% of track-plot contained soils suitable for tracking; high level of cattle; heavy loam soils and recent rain reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; uncommon; relatively recent; <i>V. gouldii</i> (likely). • <i>Ctenophorus isolepis</i> (Military Dragon) – sighted, burrows; common; recent. • Cow – tracks, scats; abundant; recent
 <p>03-05-2016 10:43</p>	<p>Site name: TP 13 Land form: Low rocky rise</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Low shrubland with hummock grass understorey. Dominant species – <i>Grevillea wickhamii</i> (1%), <i>Acacia hilliana</i> (40%), <i>Acacia lysiphloia</i> (5%), <i>Triodia</i> sp. (50%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plants present (<i>Acacia hilliana</i> and <i>A. lysiphloia</i>); substrate suitable for bilby burrows.</p> <p>Tracking conditions: Poor; overnight light rain; no shadow; 20% of track-plot contained soils suitable for tracking; rocky soils reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; uncommon; relatively recent; <i>V. gouldii</i> (likely). • Small lizard – burrows; common; recent • Dingo - scat; uncommon; old • Cow – tracks, scats; common; relatively recent




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>03.05.2016 11:35</p>	<p>Site name: TP 14 Land form: Loamy sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Shrubland (burnt) with hummock grass understorey. Dominant species – unknown shrubs (5%), <i>Triodia</i> sp (30%).</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Food indicator plant present (<i>Acacia lysiphloia</i>); substrate suitable for bilby burrows; freshly burnt with green pick available although mostly spinifex.</p> <p>Tracking conditions: Good; overnight light rain; no shadow; 40% of track-plot contained soils suitable for tracking; cattle trampling present; heavy loam soils reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; uncommon; relatively recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small goanna – burrows; common; recent • Small lizard – burrows; common; recent • Cow – tracks, scats; common; recent • Cat – sighted (flushed), uncommon; recent • Camel – tracks; uncommon; relatively recent
 <p>03.05.2016 12:17</p>	<p>Site name: TP 15 Land form: Loamy sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus</i> sp (3%), <i>Hakea</i> sp. (3%), <i>Acacia adsurgens</i> (10%), <i>Acacia lysiphloia</i> (25%), <i>Triodia pungens</i> (40%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Acacia lysiphloia</i>); substrate suitable for bilby burrows</p> <p>Tracking conditions: Good; overnight light rain; distinct shadow; 60% of track-plot contained soils suitable for tracking; loamy soils reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; uncommon; relatively recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – <i>Ctenotus pantherinus</i>; sighted; common; recent • Spectacled Hare-wallaby – scats; common. recent
 <p>03.05.2016 14:53</p>	<p>Site name: TP 16 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i>, <i>Acacia ancistrocarpa</i> (5%), <i>Senna notabilis</i> (3%), <i>Triodia pungens</i> (50%), <i>Aristida</i> sp. (2%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Senna notabilis</i>); substrate suitable for bilby burrows.</p> <p>Tracking conditions: Good; slight shadow; 80% of track-plot contained soils suitable for tracking; sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small goanna – diggings; uncommon; recent • Small lizard – burrows; common; recent • Large snake – sighted (Black-headed Python) • Camel – tracks; uncommon; relatively recent • Cow – tracks, scats; abundant; recent




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

	<p>Site name: TP 17 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low sparse woodland with hummock grass understorey (grazed). Dominant species – <i>Eucalyptus aspera</i> (1%), <i>Eucalyptus microtheca</i> (1%), <i>Petalostylis cassioides</i> (3%), <i>Senna notabilis</i> (2%), <i>Triodia pungens/schinzii</i> (25% - patchy due to burn), <i>Aristida sp.</i>, <i>Yakirra australiensis</i> (<1%).</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Food indicator plant present (<i>Senna notabilis</i>); <i>Yakirra australiensis</i> was observed; substrate suitable for bilby burrows.</p> <p>Tracking conditions: Good; slight shadow; 80% of track-plot contained soils suitable for tracking; sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, tracks, scats; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small rodent – track, scat; relatively recent; fresh • Hopping Mouse – burrow; uncommon; recent • Red Kangaroo – tracks, scat; uncommon; recent • Northern Nailtail – tracks, scats; common; recent • Cat – tracks; uncommon; recent • Camel – scats; uncommon; old • Cow – tracks, scats; common; recent
	<p>Site name: TP 18 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low sparse woodland with hummock grass understorey. Dominant species – <i>Corymbia opaca</i> (2%), <i>Acacia lysiphloia</i> (20%), <i>Senna notabilis</i> (5%), <i>Triodia schinzii</i> (60%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Senna notabilis</i>); substrate suitable for bilby burrows.</p> <p>Tracking conditions: Good; slight shadow; 70% of track-plot contained soils sandy soils improves chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, tracks, scats; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Cow – tracks, scats; abundant; recent
	<p>Site name: TP 19 Land form: Alluvial plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Low woodland with tussock grass understorey (heavily grazed). Dominant species – <i>Eucalyptus microtheca</i> (15%), <i>Hakea sp</i> (10%), <i>Corymbia aparrerinja</i> (5%), grazed tussock grasses</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Alluvial area impacted by cattle; no food indicator plants.</p> <p>Tracking conditions: Poor; slight shadow; 30 % of track-plot contained soils suitable for tracking; high level of cattle trampling and grazing; heavy loam/clay soils and recent rain reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, scats; common; recent; possibly <i>Varanus panoptes</i> (Yellow Spotted Goanna). • Small lizard – burrows; common; recent; sighted. • Cow – tracks, scats; abundant; recent




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>03.05.2016 17:12</p>	<p>Site name: TP 20 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low sparse woodland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i> (1%), <i>Hakea</i> sp. (1%), <i>Senna notabilis</i> (5%), <i>Triodia</i> sp. (20%).</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Food indicator plant present (<i>Senna notabilis</i>); substrate suitable for bilby burrows.</p> <p>Tracking conditions: Good; slight shadow; 80% of track-plot contained soils sandy soils improve chance of detecting smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, tracks; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Little Button-quail – tracks, sighting; common; recent • Cow – tracks, scats; uncommon; old
 <p>04.05.2016 08:53</p>	<p>Site name: TP 21 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus gamophylla</i> (5%), <i>Triodia pungens</i> (70%); <i>Yakirra australiensis</i> (<1%), sedges and small ground ferns present.</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Seasonally inundated; clay loam soils; <i>Yakirra australiensis</i> was observed in very low densities.</p> <p>Tracking conditions: Average to poor; slight shadow; 20% of track-plot contained soils suitable for tracking; heavy loam soils and high cryptogam crust cover reduce chance of tracking smaller animals; burrows and diggings obvious.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, tracks; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – burrows; common; recent • Small lizard – sighting (<i>Liasis burtonis</i>) • Small rodent – burrows; uncommon; fresh; likely <i>Leggadina forrestii</i>.
 <p>04.05.2016 09:27</p>	<p>Site name: TP 22 Land form: Loamy sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with hummock grass understorey. Dominant species – <i>Eucalyptus microtheca</i> (2%), <i>Eucalyptus gamophylla</i> (2%), <i>Hakea</i> sp. (1%), <i>Triodia pungens</i> (65%).</p> <p>Fire history: 2 years</p> <p>Habitat notes: No food indicator plants present</p> <p>Tracking conditions: Average; distinct shadow; 40% of track-plot contained soils suitable for tracking; heavy loam soils and high cryptogam crust cover reduce chance of tracking smaller animals; burrows and diggings obvious smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – burrows; common; recent • Cow – tracks, scats; uncommon; old

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>04.05.2016 10:33</p>	<p>Site name: TP 23 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Acacia shrubland with hummock grass understorey (burnt). Dominant species – <i>Eucalyptus setosa</i> (1%), <i>Hakea lorea</i> (2%), <i>Senna notabilis</i> (2%), <i>Corchorus sidioides</i> (3%), <i>Aristida sp.</i> (10%), <i>Triodia sp.</i> (10%), various other emergent annual grasses and herbs.</p> <p>Fire history: < 1 year</p> <p>Habitat notes: Very recent fire;</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Hopping mouse - burrow; uncommon; recent • Small lizard – burrows; common; recent • Small lizard – sighting (<i>Strophurus ciliaris</i>)
 <p>04.05.2016 11:01</p>	<p>Site name: TP 24 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Open shrubland, understorey (burnt). Dominant species – <i>Hakea sp.</i> (1%), <i>Petalostylis cassioides</i> (3%), emergent post-fire tussocks grasses and herbs (10%).</p> <p>Fire history: < 1 year</p> <p>Habitat notes: <i>Yakirra australiensis</i> was observed in low densities</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – tracks; common; recent
 <p>04.05.2016 16:54</p>	<p>Site name: TP 25 Land form: Sand plain</p> <p>Site class: Habitat</p> <p>Vegetation: Low shrubland with hummock grass understorey. Dominant species – <i>Eucalyptus pachyphylla</i> (5%), <i>Acacia coriacea</i> (5%), <i>Triodia</i> (40%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator plants present.</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small lizard – burrows; common; fresh • Large snake – tracks; common; fresh • Small snake – tracks; uncommon; fresh • Central Blue Tongue – sighting • Hopping mouse – tracks; uncommon; fresh • Australian Bustard - tracks; uncommon; recent • Cat – tracks; uncommon; fresh • Insects – tracks; common; fresh

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

	<p>Site name: TP 26 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Shrubland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i> (1%), <i>Grevillea wickhamii</i> (2%), <i>Triodia pungens</i> (80% in unburnt areas), numerous emergent annual grasses, forbs and herbs in burnt area (30%).</p> <p>Fire history: < 1 year; small scale burn.</p> <p>Habitat notes: No food indicator plants present; burn was small compared to other large scale burns in region.</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – diggings; common; fresh • Small lizard – burrows, tracks; common; fresh • Small lizard – sightings (<i>Ctenophorus isolepis</i> & <i>Ctenotus pantherinus</i>). • Central Blue Tongue – track; uncommon; fresh • Hopping mouse – tracks; uncommon; fresh • Small rodent - tracks; uncommon; recent • Cat – tracks; uncommon; fresh • Dingo – tracks, sighting; uncommon; recent • Insect – tracks; common; fresh
	<p>Site name: TP 27 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Sparse woodland with hummock grass understorey (burnt). <i>Eucalyptus aspera</i> (1%), numerous emergent annual grasses, forbs and herbs in burnt area (30%).</p> <p>Fire history: < 1 year</p> <p>Habitat notes: <i>Yakirra australiensis</i> was observed in low densities</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – tracks; common; recent • Large snake – track; uncommon; recent • Small rodent – tracks; common; fresh • Australian Bustard – tracks; uncommon; fresh • Little Button-quail – tracks, day roosts; common; fresh
	<p>Site name: TP 28 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Shrubland with hummock grass understorey. Dominant species – <i>Hakea coriacea</i> (1%), <i>Corymbia opaca</i> (2%), <i>Acacia lysiphloia</i> (3%), <i>Acacia sp.</i> (35%), <i>Triodia sp.</i> (70%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant is present (<i>Acacia lysiphloia</i>).</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals; high vegetation cover reduced tracking shadow.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Hopping mouse – burrow; uncommon; old

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016



Site name: TP 30

Land form: Sand plain

Site class: Habitat

Vegetation: Shrubland with hummock grass understorey. Dominant species – *Corymbia opaca* (1%), *Hakea coriacea* (1%), *Acacia lysiphloia* (15%), *Triodia sp.* (50%)

Fire history: > 3 years, long unburnt

Habitat notes: Food indicator plant is present (mature - *Acacia lysiphloia*).

Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.

Fauna signs:

- Small goanna – diggings; common; recent
- Red Kangaroo – track; uncommon; recent
- Small lizard – diggings, burrows; common; recent
- Button-quail – tracks, day roost; common; fresh
- Cow – tracks; uncommon; old



Site name: TP 31

Land form: Sand plain

Site class: Putative Greater Bilby

Vegetation: Shrubland with hummock grass understorey. Dominant species – *Atalaya hemiglauca* (1%), *Hakea coriacea* (1%), *Hakea lorea* (1%), *Acacia lysiphloia* (15%), *Carissa lanceolata* (5%), *Triodia sp.* (50%), *Aristida sp.* (15%)

Fire history: > 3 years

Habitat notes: Food indicator plant is present (mature - *Acacia lysiphloia*).

Tracking conditions: Average; distinct shadow; 50% of track-plot contained soils suitable for tracking smaller animals; cryptogam crust.

Fauna signs:

- Large goanna – burrow, diggings; common; recent; likely *Varanus gouldii* (Sand Goanna).
- Small lizard – diggings, burrows; common; recent



Site name: TP 32

Land form: Sand plain

Site class: Putative Greater Bilby

Vegetation: Low sparse woodland with hummock grass understorey. Dominant species – *Eucalyptus aspera* (2%), *Acacia sp.* (15%), *Triodia sp.* (65%)

Fire history: > 3 years




Habitat notes: No food indicator species present.

Tracking conditions: Good; distinct shadow; 70% of track-plot contained soils suitable for tracking smaller animals




Fauna signs:

- Large goanna – burrow, diggings; common; recent; likely *Varanus gouldii* (Sand Goanna).
- Small lizard – burrows; sighting; common; recent
- Cat – tracks; common; fresh
- Small rodent – tracks; common; recent
- Small rodent – sighting (likely *Pseudomys desertor*)
- Hopping mouse – tracks; uncommon; fresh
- Australian Bustard – tracks; common; fresh
- Fox – track; uncommon; relatively recent
- Small snake – track; uncommon; recent
- Button-quail – tracks; common; fresh




Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

	<p>Site name: TP 33 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Low sparse woodland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i> (1%), <i>Corymbia opaca</i> (1%), <i>Hakea</i> sp. (1%), <i>Petalostylis cassioides</i> (3%), <i>Triodia</i> sp. (25%)</p> <p>Fire history: < 1 year</p> <p>Habitat notes: <i>Yakirra australiensis</i> was observed in very low densities</p> <p>Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking smaller animals</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small goanna – burrow, digs; common; recent • Small lizards – burrows; sighting (<i>Ctenophorus isolepis</i>, <i>Lerista</i> sp.); common; recent • Dasyurid – tracks; uncommon; recent • Small rodent – tracks; common; recent • Hopping mouse – tracks, pop-holes; uncommon; fresh • Button-quail – tracks; common; fresh
	<p>Site name: TP 34 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Shrubland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i> (<1%), <i>Corymbia opaca</i> (<1%), <i>Triodia</i> sp. (25% - in unburnt areas), emergent post fire grass, herbs, and forbs in burnt area.</p> <p>Fire history: < 1 year</p> <p>Habitat notes: <i>Yakirra australiensis</i> was observed in low densities</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small goanna – burrow, digs; common; recent • Small lizards – burrows; tracks; common; recent • Dasyurid – tracks; uncommon; recent • Small rodent – tracks; common; recent • Australian Bustard – tracks; uncommon; recent • Hopping mouse – tracks; uncommon; fresh • Hopping birds – tracks; common; recent
	<p>Site name: TP 35 Land form: Sand plain</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low sparse woodland with tussock grass understorey (grazed). Dominant species – <i>Acacia aneura</i>, <i>Eucalyptus brevifolia</i>, <i>Hakea arborescens</i>, <i>Aristida</i> sp.</p> <p>Fire history: < 1 year</p> <p>Habitat notes: <i>Yakirra australiensis</i> was observed in low densities</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – burrow, digs; common; recent • Small rodent – tracks; uncommon; recent • Hopping mouse – tracks; common; fresh • Hopping birds – tracks; common; recent • Button-quail – tracks; common; fresh • Cat – tracks; common; fresh

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>06.05.2016 08:39</p>	<p>Site name: TP 40 Land form: Sand plain</p> <p>Site class: Habitat</p> <p>Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – <i>Corymbia opaca</i> (1%), <i>Hakea lorea</i> (1%), <i>Eucalyptus pachyphylla</i> (1%), <i>Acacia sp.</i> (10%), <i>Triodia sp.</i> (40%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator species present.</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, diggings; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small goanna – burrow, digs; common; recent • Small lizards – burrows; tracks; common; recent • Small snake – track; uncommon; fresh • Small rodent – tracks; common; recent • Cat – tracks; relatively common; recent • Australian Bustard – tracks; uncommon; recent • Hopping birds – tracks; common; recent • Button-quail – tracks; common; fresh • Invertebrates – tracks; common; fresh
 <p>06.05.2016 12:04</p>	<p>Site name: TP 41 Land form: Sand plain</p> <p>Site class: Habitat</p> <p>Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – <i>Corymbia opaca</i> (2%), <i>Hakea lorea</i> (1%), <i>Eucalyptus aspera</i> (1%), <i>Acacia adsurgens</i> (10%), <i>Acacia sp.</i> (15%), <i>Triodia sp.</i> (40%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator species present.</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – burrow, digs; common; recent • Small lizard – burrow, sighting; track; common; recent • Small snake – track; uncommon; fresh • Small rodent – tracks; uncommon; recent • Cat – tracks; relatively common; recent • Hopping birds – tracks; common; recent • Button-quail – tracks; common; fresh • Invertebrates – tracks; common; fresh
 <p>06.05.2016 12:35</p>	<p>Site name: TP 42 Land form: Depression</p> <p>Site class: Habitat</p> <p>Vegetation: Low sparse woodland with tussock and hummock grass understorey. Dominant species – <i>Hakea coriacea</i> (2%), <i>Melaleuca sp.</i> (2%), <i>Triodia sp.</i> (10%), <i>Aristida sp.</i> (40%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Large ground termite mounds suggest palaeo drainage features however no typical food indicator plants found.</p> <p>Tracking conditions: Good; distinct shadow; 90% of track-plot contained soils suitable for tracking smaller animals.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – burrow, digs; common; recent • Small goanna – sighted in termite mound (identification of species not confirmed) • Small lizard – burrows; common; recent • Small rodent – tracks, scats; common; relatively recent.

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>06 05 2016 12:57</p>	<p>Site name: TP 43 Land form: Low rocky rise</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – <i>Grevillea wickhamii</i> (2%), <i>Grevillea sp.</i> (1%), <i>Eucalyptus sp.</i> (1%), <i>Acacia hilliana</i> (25%), <i>Triodia sp.</i> (35%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Acacia hilliana</i>); low rocky rise constitutes suitable habitat.</p> <p>Tracking conditions: Average; distinct shadow; 40% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – diggings, tracks; common; recent • Small lizard – burrows; common; recent • Australian Bustard - feather; uncommon; recent • Hopping birds – tracks; common; recent
 <p>06 05 2016 13:27</p>	<p>Site name: TP 44 Land form: Low rocky rise</p> <p>Site class: Habitat</p> <p>Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – <i>Hakea lorea</i> (1%), <i>Eucalyptus sp.</i> (1%), <i>Acacia ancistrocarpa</i> (3%), <i>Acacia hilliana</i> (25%), <i>Triodia sp.</i> (35%).</p> <p>Fire history: 1 to 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Acacia hilliana</i>); low rocky rise constitutes suitable habitat.</p> <p>Tracking conditions: Poor; distinct shadow; 20% of track-plot contained soils suitable for tracking (mostly rocky substrate)</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small lizard – burrows; common; recent • Red Kangaroo – tracks; uncommon; old • Australian Bustard - feather; uncommon; recent • Hopping birds – tracks; common; recent • Button-quail – tracks; common; fresh
 <p>06 05 2016 14:47</p>	<p>Site name: TP 45 Land form: Low rocky rise</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – <i>Eucalyptus aspera</i> (1%), <i>Acacia sp.</i> (3%), <i>Acacia hilliana</i> (2%), <i>Triodia sp.</i> (40%).</p> <p>Fire history: 1 to 3 years</p> <p>Habitat notes: Food indicator plant present (<i>Acacia hilliana</i>); low rocky rise constitutes suitable habitat.</p> <p>Tracking conditions: Poor; distinct shadow; 25% of track-plot contained soils suitable for tracking (mostly rocky substrate)</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – diggings, tracks; common; recent • Small lizard – burrows; sightings; common; recent • Small snake – track; uncommon; recent • Hopping mouse – track; uncommon; recent • Cat – tracks; uncommon; recent • Hopping birds – tracks; common; recent

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016



Site name: TP 46

Land form: Loamy sand plain

Site class: Habitat

Vegetation: Low open woodland with hummock grass understorey. Dominant species – *Eucalyptus gamophylla* (5%), *Hakea arborescens* (2%), *Acacia ancistrocarpa* (5%), *Triodia sp.* (35%)

Fire history: > 3 years

Habitat notes: No food indicator plants present.

Tracking conditions: Average; distinct shadow; 50% of track-plot contained soils suitable for tracking; heavy loam soils reduce chance of tracking smaller animals.

Fauna signs:

- Small goanna – diggings, tracks; common; recent
- Australian Bustard - feather; uncommon; recent
- Hopping bird – tracks; common; recent



Site name: TP 47

Land form: Low rocky rise

Site class: Habitat / Goanna

Vegetation: Acacia shrubland with hummock grass understorey. Dominant species – *Acacia aneura*, *Eucalyptus brevifolia*, *Hakea arborescens*, *Aristida sp.*

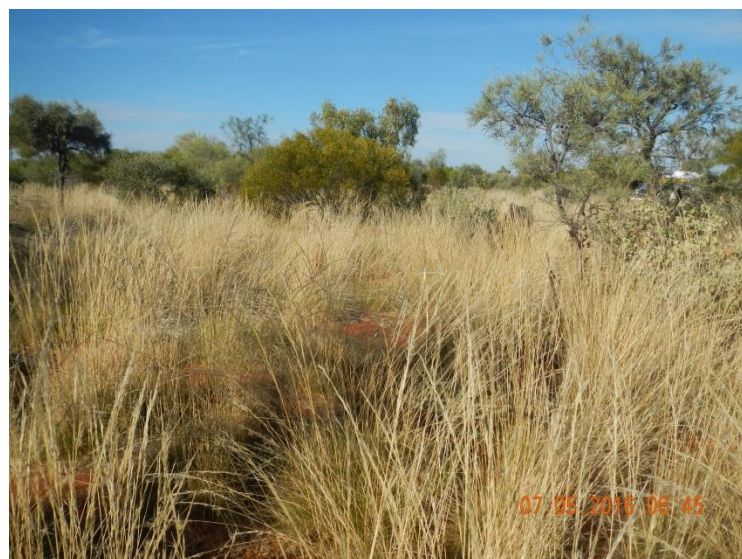
Fire history: 1 to 3 years

Habitat notes: Food indicator plant present (*Acacia hilliana*); low rocky rise constitutes suitable habitat.

Tracking conditions: Poor; slight shadow; 25% of track-plot contained soils suitable for tracking (mostly rocky substrate).

Fauna signs:

- Small goanna – diggings, tracks; common; recent
- Small lizard – tracks; uncommon; recent
- Small rodent – tracks; uncommon; recent
- Hopping bird – tracks; common; recent



Site name: TP 48

Land form: Sand plain

Site class: Habitat

Vegetation: Low open woodland with hummock grass understorey. Dominant species – *Corymbia opaca* (1%), *Hakea lorea* (1%), *Hakea arborescens* (1%), *Acacia ancistrocarpa* (2%), *Acacia lysiphloia* (5%), *Acacia sp.* (3%), *Triodia sp.* (50%)

Fire history: > 3 years

Habitat notes: Food indicator species present (*Acacia lysiphloia* – mature).

Tracking conditions: Good; distinct shadow; 50% of track-plot contained soils suitable for tracking; high cryptogam crust on remaining bare soils (reduces ability to detect fauna tracks).

Fauna signs:

- Small goanna – burrow, digs; uncommon; recent
- Small lizards – burrows; tracks; common; recent
- Small rodent – tracks; common; recent
- Hopping mouse – tracks; uncommon; recent
- Cat – tracks; relatively common; recent
- Australian Bustard – tracks; uncommon; recent
- Button-quail – tracks; common; fresh
- Invertebrates – tracks; common; fresh

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016



Site name: TP 49

Land form: Sand plain

Site class: Habitat

Vegetation: Shrubland with tussock grass understorey. Dominant species – *Atalaya hemiglauca* (2%), *Acacia lysiphloia* (5%), *Carissa lanceolata* (5%), *Aristida sp.* (10%), *Eragrostis sp.* (10%), *Triodia sp.* (5%)

Fire history: > 3 years

Habitat notes: Food indicator species present (*Acacia lysiphloia* – mature).

Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking.

Fauna signs:

- Small goanna – burrow, digs; uncommon; recent
- Small lizards – burrows; tracks; common; recent
- Central Blue Tongue – track; uncommon; recent
- Dasyurid – tracks; uncommon; recent
- Small rodent – tracks; common; recent
- Hopping mouse – tracks; uncommon; recent
- Button-quail – tracks; common; fresh
- Invertebrates – tracks; common; fresh



Site name: TP 50

Land form: Sand plain

Site class: Habitat / Goanna

Vegetation: Shrubland with hummock grass understorey. Dominant species – *Ventilago viminalis* (2%), *Acacia coriacea* (1%), *Acacia lysiphloia* (5%), *Triodia sp.* (5%)

Fire history: > 3 years

Habitat notes: Food indicator species present (*Acacia lysiphloia* – mature).

Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking.

Fauna signs:

- Large goanna – burrow, diggings; common; recent; likely *Varanus gouldii* (Sand Goanna).
- Small goanna – burrow, digs; uncommon; recent
- Small lizards – burrows; tracks; common; recent
- Large snake – sighting (Mulga Snake)
- Small rodent – tracks; common; recent
- Hopping mouse – tracks; uncommon; recent
- Button-quail – tracks; common; fresh
- Hopping bird – tracks; uncommon; fresh



Site name: TP 51

Land form: Low rocky rise

Site class: Habitat / Goanna

Vegetation: Low Acacia Shrubland with hummock grass understorey. Dominant species – *Acacia hilliana* (40%), *Triodia sp.* (40%)

Fire history: > 3 years




Habitat notes: Food indicator species present (*Acacia hilliana*).

Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking; remaining areas were rocky substrate.




Fauna signs:

- Large goanna – burrow; common; recent; likely *Varanus gouldii* (Sand Goanna).
- Small lizards – tracks; common; recent
- Button-quail – tracks; common; fresh
- Invertebrates – tracks, diggings; uncommon; fresh

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

	<p>Site name: TP 52 Land form: Low rocky rise</p>
	<p>Site name: TP 53 Land form: Low rocky rise</p> <p>Site class: Habitat</p> <p>Vegetation: Low Acacia Shrubland with hummock grass understorey. Dominant species – <i>Acacia hilliana</i> (40%), <i>Triodia sp.</i> (40%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: Food indicator species present (<i>Acacia hilliana</i>).</p> <p>Tracking conditions: Average; distinct shadow; 45% of track-plot contained soils suitable for tracking; remaining areas were rocky substrate.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – burrow, digs; uncommon; recent • Small lizards –sighted; tracks; common; recent • Small rodent – tracks, scats; common; recent • Hopping mouse – tracks; uncommon; recent • Bush Stone-curlew – tracks; uncommon; fresh • Button-quail – tracks; common; fresh • Cat – tracks; uncommon; old • Cow – tracks; uncommon; old • Invertebrates – tracks, burrows; uncommon; recent
	<p>Site name: TP 54 Land form: Depression</p> <p>Site class: Habitat</p> <p>Vegetation: Low open woodland with tussock grass understorey (grazed). Dominant species – <i>Acacia aneura</i>, <i>Eucalyptus brevifolia</i>, <i>Hakea arborescens</i>, <i>Aristida sp.</i></p> <p>Fire history: > 3 years, long unburnt</p> <p>Habitat notes: Palaeo drainage characteristics.</p> <p>Tracking conditions: Average to poor; distinct shadow; 20% of track-plot contained soils suitable for tracking; heavy loam soils and recent rain reduce chance of tracking smaller animals</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Small goanna – sighted (on termite mound); common; recent • Small lizard – sighted (<i>Morethia ruficauda</i>, <i>Carlia sp.</i>)

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016

 <p>08-05-2016 15:44</p>	<p>Site name: TP 55 Land form: Sand plain</p> <p>Site class: Habitat / Goanna</p> <p>Vegetation: Acacia Shrubland with hummock grass understorey. Dominant species – <i>Corymbia opaca</i> (1%), <i>Hakea</i> sp. (1%), <i>Carissa lanceolata</i> (2%), <i>Acacia</i> sp. (20%), <i>Triodia</i> sp. (45%), <i>Aristida</i> sp. (5%).</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator plants present.</p> <p>Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow; common; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small rodent – tracks; uncommon; recent • Small lizard – burrows; common; recent • Button-quail – tracks, scats; common; recent
 <p>07-05-2016 14:55</p>	<p>Site name: TP 56 Land form: Sinkhole</p> <p>Site class: Habitat</p> <p>Vegetation: Vine-thicket (in sinkhole – fire protected)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator species present.</p> <p>Tracking conditions: Poor; slight shadow; 20% of track-plot contained soils suitable for tracking.</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Dingo – scat; uncommon; recent • Small lizard – sighted; common; recent
 <p>23-03-2016 15:00</p>	<p>Site name: TP 60 Land form: Depression</p> <p>Site class: Putative Greater Bilby</p> <p>Vegetation: Low open woodland with tussock grass understorey (grazed). Dominant species – <i>Carissa lanceolata</i> (5%), <i>Melaleuca glomerata</i> (5%)</p> <p>Fire history: > 3 years</p> <p>Habitat notes: No food indicator plants present.</p> <p>Tracking conditions: Good; distinct shadow; 80% of track-plot contained soils suitable for tracking; high level of cattle trampling and grazing</p> <p>Fauna signs:</p> <ul style="list-style-type: none"> • Large goanna – burrow, tracks; abundant; recent; likely <i>Varanus gouldii</i> (Sand Goanna). • Small lizard – burrows; common; recent • Cow – tracks, scats; abundant; recent

Greater Bilby (*Macrotis lagotis*) track-plot site descriptions, May 2016



Site name: TP 61

Land form: Playa

Site class: Habitat

Vegetation: Sedges.

Fire history: > 3 years, long unburnt

Habitat notes: Small muddy patch; no surface water; no food indicator species present.

Tracking conditions: Poor; slight shadow; 5% of track-plot contained soils suitable for tracking.

Fauna signs:

- Small lizard – burrows; uncommon; recent



Site name: TP 62

Land form: Playa

Site class: Habitat

Vegetation: Low open woodland with hummock grass understorey. Dominant species – *Melaleuca glomerata* (5%), *Eucalyptus microtheca* (5%), *Triodia pungens* (60%)

Fire history: > 3 years

Habitat notes: No food indicator plants present.

Tracking conditions: Average; slight shadow; 65% of track-plot contained soils suitable for tracking

Fauna signs:

- Australian Bustard - feather; uncommon; recent
- Small lizard – burrows; common; recent

Appendix K

.....Greater Bilby track-plot survey photographs

This page has been intentionally left blank

Greater Bilby (*Macrotis lagotis*) survey photographs, May 2016

Examples of goanna diggings and burrows that were recorded as Putative Greater Bilby sign during the aerial transects. Note GPS is 15 cm (including antenna).



Greater Bilby (*Macrotis lagotis*) survey photographs, May 2016

Photographs of sign or sightings from other species recorded within the 2 ha track-plot sites



Small rodent burrow



Small rodent burrow



Small rodent burrow



Small rodent runway of tracks



Fresh tracks from large rodent / dasyurid (suspected to belong to Long-haired Rat *Rattus villosissimus* due to multiple sighting of the species, but could not discount possibility of Brush-tailed Mulgara *Dasyurus blythi*) (note book is 12 cm long)



Potential Central Pebble Mound Mouse (*Pseudomys johnsoni*)

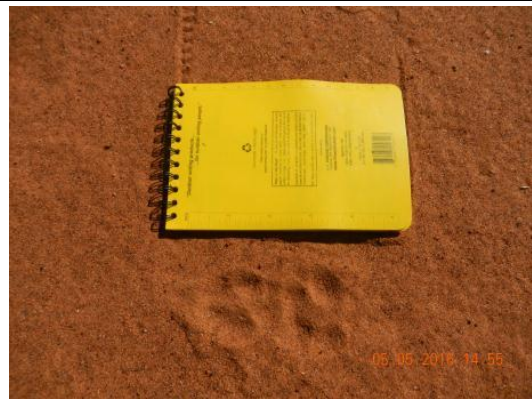


Potential Central Pebble Mound Mouse (*Pseudomys johnsoni*)

Greater Bilby (*Macrotis lagotis*) survey photographs, May 2016



Suspected Red Fox (*Vulpes vulpes*) track



Suspected Red Fox (*Vulpes vulpes*) track



Black-headed Python (*Aspedites melanocephalus*)



Spiny-tailed Gecko (*Strophurus ciliaris*)



Fresh small snake track



Tracks from *Lerista* sp. (likely *L. bipes*)



Fresh tracks from Australian Bustard (*Ardeotis australis*)



Centralian Blue Tongue Lizard (*Tiliqua multifaciata*)

Greater Bilby (*Macrotis lagotis*) survey photographs, May 2016



Button-quail day roost (likely Little Button-quail *Turnix velox*)



Button-quail tracks (likely Little Button-quail *Turnix velox*)



Tracks from bird species with a bipedal hop (referred to as 'hopping birds' throughout this report)



Fresh lizard track



Fresh Mole-cricket mound



Scats from Spectacled Hare-wallaby (*Lagorchestes conspicillatus*)

Appendix L

.....Gouldian Finch site descriptions of breeding sites

This page has been intentionally left blank

Gouldian Finch (*Erythrura gouldiae*) breeding survey site descriptions, May 2016



Site name: B1S1

Land form: Rocky plain

Site class: Breeding survey site

Vegetation: Low open woodland with hummock grass understory. Dominant species – *Eucalyptus leucophloia*, *Triodia* spp., *Acacia chisolmii*.

Fire history: > 2 years.

Habitat notes: Rocky plain along drainage line below low slope. *E. leucophloia* generally had thin, re-sprouted trunk stems due previous fires. *Triodia* sp. had formed established hummocks and was the only grass species observed.

Hollow assessment: 52 trees were inspected along the transect – 14 had hollows, with a total of 31 hollows within the site. Only 3 hollows were in living tissue. Hollow entrance diameters were between 2 and 10 cm (median 6 cm) and hollows were between 1.8 and 6 metres above the ground (median 3 m).

Gouldian surveys: No Gouldian Finches (*Erythrura gouldiae*) were detected during the survey nor were any other finch species detected.



Site name: B1S2

Land form: Low rocky rise

Site class: Breeding survey site

Vegetation: Sparse woodland with hummock grass understory. Dominant species – *Eucalyptus leucophloia*, *E. leucophylla*, *Corymbia aparrerinja*, *Triodia* spp., *Acacia chisolmii*.

Fire history: Burnt last year

Habitat notes: Rocky site on lower slope with northerly aspect. *Eucalyptus* spp. (apart from *C. aparrerinja*) were short with multiple thin stems. *Triodia* sp. were small – forming open hummock grassland.

Hollow assessment: There were only 21 trees along the transect of which only 4 had a single hollow each. These hollows were all in *E. leucophloia*, between 2 and 4 m from the ground and between 4 and 10 cm in diameter at the entrance. The hollows were all > 60° with 3 in dead tissue.

Gouldian surveys: No Gouldian Finches were detected through the survey, 5 Zebra Finches were seen.



Site name: B1S3

Land form: Low rocky ridge

Site class: Breeding survey site

Vegetation: Open woodland with hummock grass understory. Dominant species – *Eucalyptus leucophloia*, *E. leucophylla*, *Corymbia terminalis*, *Triodia* spp., *Acacia chisolmii*.

Fire history: 1-2 years unburnt


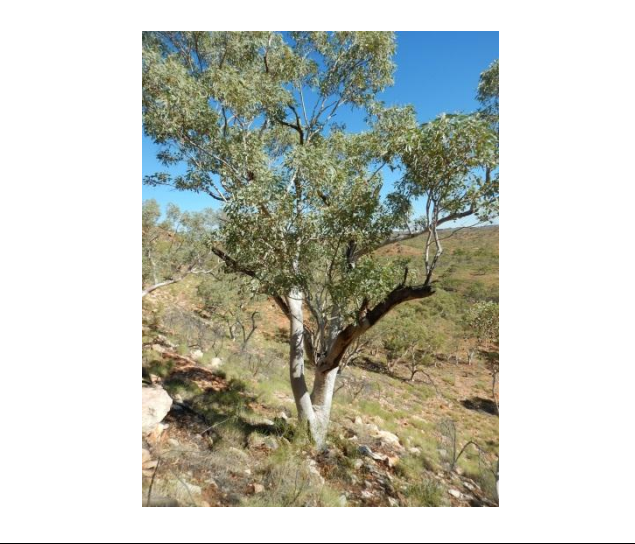

Habitat notes: Rocky site with westerly aspect on a low rocky rise running north-south. Some larger *E. leucophloia* especially towards the top of the ridgeline where trees were in higher density. *Triodia* spp. formed some complex hummocks – increasing up ridgeline. *Acacia chisolmii* provided sparse shrub mid-story.

Hollow assessment: There were 60 trees along the transect, of which 18 had hollows – most hollow containing trees had multiple hollows (33 hollows total). Hollows were 0.6 and 4 m above the ground and between 3 and 15 cm in diameter at the entrance (median 5 cm). The hollows were all in dead tissue though a occurred at mix of angles.

One hollow contained nesting material though nest was elongated and larger than a simple cup shaped Gouldian Finch nest. Nest was in a large (15 cm diameter) burnt spout, 1.5 m above ground.

Gouldian surveys: No Gouldian Finches were detected through the survey, 5 Zebra Finches were seen.

Gouldian Finch (*Erythrura gouldiae*) breeding survey site descriptions, May 2016

	<p>Site name: B2S1</p> <p>Land form: Rocky ridgeline</p> <p>Site class: Breeding survey site</p> <p>Vegetation: Sparse woodland with hummock grass understory. Dominant species – <i>Eucalyptus leucophloia</i>, <i>E. leucophylla</i>, <i>Corymbia terminalis</i>, <i>Triodia spp.</i></p> <p>Fire history: 1 year unburnt</p> <p>Habitat notes: Rocky site over a rocky ridgeline running north-south. Larger <i>E. leucophloia</i> on top of the ridgeline where trees were in higher density. <i>Triodia spp.</i> was generally simple and small due to recent fire.</p> <p>Hollow assessment: There were 63 trees along the transect, of which 15 had hollows – 5 of these trees had multiple hollows (22 hollows total). Hollows were between 1.5 and 2.5 m above the ground and between 3 and 15 cm in diameter at the entrance (median 5 cm).</p> <p>There was no evidence of breeding.</p> <p>Gouldian surveys: No Gouldian Finches were detected through the survey, 2 Zebra Finches were seen.</p>
	<p>Site name: B3S1</p> <p>Land form: Rocky hills</p> <p>Site class: Breeding survey site</p> <p>Vegetation: Open woodland with hummock grass understory. Dominant species – <i>Eucalyptus leucophloia</i>, <i>Triodia spp.</i>, <i>Acacia chisolmii</i>.</p> <p>Fire history: 1-2 years unburnt</p> <p>Habitat notes: Rocky site with westerly aspect on steep rocky hill toward a distinct saddle. A small drainage line supported some larger <i>E. leucophloia</i>. <i>Triodia spp.</i> formed some complex hummocks though was generally small due to fire. Isolated <i>Acacia chisolmii</i> provided sparse shrub mid-story.</p> <p>Hollow assessment: There were 73 trees along the transect, of which 11 had hollows (22 hollows total). Hollows were between 1 and 4 m above the ground and between 3 and 12 cm in diameter at the entrance (median 4 cm). The hollows were all in dead tissue and mostly at > 45°.</p> <p>There was no evidence of breeding observed.</p> <p>Gouldian surveys: No finches were detected during the survey.</p>
	<p>Site name: B4S1</p> <p>Land form: Rocky hills</p> <p>Site class: Breeding survey site</p> <p>Vegetation: Open woodland with hummock grass understory. Dominant species – <i>Eucalyptus leucophloia</i>, <i>Triodia spp.</i></p> <p>Fire history: 2 years unburnt</p> <p>Habitat notes: Rocky site with an easterly aspect running parallel to a rocky ridgeline. <i>E. leucophloia</i> were generally, small and multi-stemmed. <i>Triodia sp.</i> formed some complex hummocks in open hummock grassland.</p> <p>Hollow assessment: There were 53 trees along the transect, of which only 3 had hollows (3 hollows total). Hollows were between 2.2 and 3.5 m above the ground and between 3 and 5 cm in diameter at the entrance.</p> <p>Gouldian surveys: No Gouldian Finches were detected through the survey, 1 Painted Finch was seen.</p>

Appendix M

.....Gouldian Finch site descriptions of feeding sites

This page has been intentionally left blank

Gouldian Finch (*Erythrura gouldiae*) feeding survey site descriptions, May 2016



Site name: GFF1

Land form: Drainage line

Site description: Approximately 5-6 m wide band along either side of creek line which passes near rocky outcrop. Red, sandy soil extending from surrounding rocky plains through creek bed. Moderate level of cattle caused erosion along creek bank.

Vegetation: Tussock grasses – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line. Buffel grass shows signs of heavy grazing pressure from cattle. Recently burnt Spinifex Grass behind in open hummock grassland. *E. leucophylla* along creek banks with *Melaleuca bracteata* forming dense stands within drainage line.

Fire history: 2 years unburnt.

Habitat assessment: Heavy grazing pressure from cattle would indicate a lack of seeding grasses to be present. The dominance of Buffel grass through the site shows a lack of grass diversity which is needed to providing seeding at different times.



Site name: GFF2

Land form: Drainage line

Site description: Multiple linear strips along drainage lines and creek beds. Outcropping of rocks in rocky plains, with red sandy soils with patches of grey sandy soils close to drainage lines. Permanent water source from bore fed trough at site. Severe cattle caused erosion along banks.

Vegetation: Tussock grasses – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line. Buffel grass shows signs of heavy grazing pressure from cattle. Recently burnt Spinifex Grass behind in open hummock grassland. *E. leucophylla* with *Melaleuca bracteata* forming patches within drainage line.

Fire history: 1 year unburnt.

Habitat assessment: No native grasses were identified at the site needed for Gouldian Finch feeding. The mono-species patches of heavily grazed Buffel grass does not constitute suitable wet season breeding habitat.



Site name: GFF3

Land form: Drainage line

Site description: Low lying area along drainage line between higher rocky plains, with red soils (patches of grey soil close to drainage line) and high rock content. Severe cattle caused erosion along banks.

Vegetation: Wide stretch of tussock grass – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line with large bare areas and common weeds (especially Kapock bush - *Aerva javanica*). Buffel grass shows signs of heavy grazing pressure from cattle. Recently burnt Spinifex Grass behind in open hummock grassland. *E. camaldulensis* and *E. leucophylla* with *Melaleuca bracteata* forming patches within drainage line.

Fire history: 1 year unburnt.

Habitat assessment: No native grasses were identified at the site needed for Gouldian Finch feeding. The mono-species patches of heavily grazed Buffel grass does not constitute suitable wet season breeding habitat. Heavy erosion and grazing pressure from cattle further reduce the suitability of feeding habitat.

Gouldian Finch (*Erythrura gouldiae*) feeding survey site descriptions, May 2016



Site name: GFF4

Land form: Creek line

Site description: Narrow band along either side of creek line. Red, sandy soil extending from surrounding rocky plains through creek bed. Moderate level of cattle caused erosion along creek bank.

Vegetation: Narrow band (< 2 m wide) of tussock grasses – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line. Recently burnt Spinifex Grass behind in open hummock grassland. Sparse *E. camaldulensis* along creek bank intermixed with *E. leucophylla*.

Fire history: 1 year unburnt.

Habitat assessment: Narrow band of mono species tussock grass (*C. ciliaris*) along creek line is unlikely to provide suitable wet season foraging habitat for the Gouldian Finch.



Site name: GFF5

Land form: Drainage line

Site description: Margin of drainage line surrounded by rocky plains with rock outcrops. Red sandy plains lead to grey sandy soil along drainage line. Site shows signs of moderate to severe cattle erosion and grazing on introduced pasture grasses.

Vegetation: Wide stretch of tussock grass – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line - with native species present along edge of bank (*Themeda triandra*, *Heteropogon contortus*) and *Aristida* sp. scattered throughout. Buffel grass shows signs of heavy grazing pressure. *E. camaldulensis*, *E. leucophylla* and *Corymbia terminalis* with sparse *A. chisholmii* over *Triodia pungens* back from drainage line.

Fire history: 1 year unburnt.

Habitat assessment: The presence of native grass species indicates that there may be seeding grasses at differing times of the year – a requirement for Gouldian Finch feeding. However, the area of native grass species is small and, combined with the heavy impact of cattle and fire present marginal feeding habitat at best.



Site name: GFF6

Land form: Creek line

Site description: Margin of watercourse with running water. Red sandy soils, showing signs of moderate, cattle caused erosion and grazing pressure.

Vegetation: Wide stretch of tussock grass – predominately Buffel Grass (*Cenchrus ciliaris*) along the creek line - with native species present along edge of bank (*Themeda triandra*, *Heteropogon contortus*). Buffel grass shows signs of heavy grazing pressure. *E. camaldulensis*, *E. leucophylla* and *Corymbia terminalis* with sparse *A. chisholmii* over *Triodia pungens* back from drainage line.

Fire history: 1 year unburnt.

Habitat assessment: The presence of native grass species indicates that there may be seeding grasses at differing times of the year – a requirement for Gouldian Finch feeding. However, the area of native grass species is small and, combined with the heavy impact of cattle and fire present marginal feeding habitat at best.

Gouldian Finch (*Erythrura gouldiae*) feeding survey site descriptions, May 2016



Site name: GFF7

Land form: River line

Site description: Margin of Mica Creek and surrounding flats. Site had deep, sandy, brown soil. Long term water was present at the crossing with Diamantina Developmental Road, approximately 50 m from site. There was signs of cattle caused erosion along stream banks, although little grazing pressure.

Vegetation: Wide stretches of tussock grass – predominately Buffel Grass (*Cenchrus ciliaris*) and Annual Mission Grass (*Pennisetum pedicellatum*) along the creek line - with isolated native species (*Themeda triandra*, *Heteropogon contortus*) at very edge of watercourse. Upper story of *E. camaldulensis*, *E. leucophylla*, *E. leucophloia* and *Corymbia terminalis* with *Triodia pungens* back from drainage line.

Fire history: > 2 years unburnt.

Habitat assessment: Although the site was the longest unburnt site and didn't show signs of over-grazing, there was only isolated native grasses – the area being dominated by Buffel grass and Annual Mission Grass.



Site name: GFF8

Land form: Drainage line

Site description: Narrow margin along drainage line with dark reddish brown sandy soils to a shallow depth surrounded by rocky plains.

Vegetation: Small patches of Buffel Grass (*Cenchrus ciliaris*) with Spinifex (*Triodia pungens*) extending to the drainage line in a number of locations. Upper story of dominated by *E. leucophylla* with isolated *Corymbia terminalis*. Dense but isolated patches of *Melaleuca bracteata* within the drainage line. Abundant occurrence of Kapok Bush (*Aerva javanica*) throughout the site.

Fire history: 1-2 years

Habitat assessment: Site does not provide extensive areas of suitable tussock grasses for Gouldian Finch feeding in the wet season. Area is primarily Spinifex Grass with small patches of Buffel grass showing signs of over grazing.



Site name: GFF9

Land form: Drainage line

Site description: Narrow margin along both banks of rocky drainage line surrounded by rocky plains. Red sandy soils throughout with high rock content and outcropping. Moderate level of cattle caused erosion along bank.

Vegetation: Patches of Buffel Grass (*Cenchrus ciliaris*) along drainage line which are heavily grazed by cattle. Isolated native species (*Themeda triandra*, *Heteropogon contortus*) at very edge of watercourse. *E. leucophylla* dominated upper story with isolated *Corymbia terminalis*. Common *A. chisholmii* throughout and *Triodia pungens* approximately 1-2 m from drainage. Abundant occurrence of Kapok Bush (*Aerva javanica*) throughout the site.

Fire history: Burnt last year

Habitat assessment: Only isolated native grasses and generally small area of tussock grasses combined with recent (and likely frequent) fire indicates the site would not provide good wet season feeding habitat.

Gouldian Finch (*Erythrura gouldiae*) feeding survey site descriptions, May 2016



Site name: GFF10

Land form: Drainage line

Site description: Narrow margin along both banks of rocky drainage line surrounded by rocky plains. Red brown shallow sandy soils throughout with high rock content and outcropping. Moderate level of cattle caused erosion along bank.

Vegetation: Patches of Buffel Grass (*Cenchrus ciliaris*) along drainage line which are heavily grazed by cattle. *E. leucophylla* dominated upper story with sparse *A. chisholmii* throughout and *Triodia pungens* approximately 1-2 m from drainage. Abundant occurrence of Kapok Bush (*Aerva javanica*) throughout the site.

Fire history: Burnt last year

Habitat assessment: Lack of native grasses and the impact of fire and grazing indicate that the site would not provide suitable feeding habitat. The site is also small and weed infested.

Appendix N

.....**Painted Honeyeater habitat descriptions of survey sites**

This page has been intentionally left blank

Painted Honeyeater (*Grantiella picta*) survey site descriptions, May 2016



View west along creekline

Site name: Bird count 1

Land form: Creekline and adjacent alluvial flats

Vegetation: Open forest dominated by River Red Gum *Eucalyptus camaldulensis* along creekline (RE1.3.7) over native grasses mixed with exotic Annual Mission Grass *Pennisetum pedicellatum*. Within adjacent Gidgee *Acacia cambagei* woodland (RE1.3.4) over *Triodia* sp. Patchy shrub layer of *Acacia* sp. along creek.

Habitat values: Water present at creekline site fed by upstream spring at time of survey. Relatively diverse shrub layer along creek. Moderate mistletoe presence in River Red Gums and sparse presence in adjacent Gidgee woodland. Abundant tree hollows along creekline.

Disturbance evidence: Heavy cattle impact along creekline with obvious impacts on grass layer (foraging and sheltering) and bank erosion. Little evidence of recent fire. Annual Mission Grass (exotic species) dominant along creek edge.

Bird observations: Diverse site with 22 bird species recorded. Likely due to local relative resource diversity within landscape. Gilbert's Dragon *Lophognathus gilberti* also observed along creekline.



View west across creekline

Site name: Bird count 2

Land form: Creekline and adjacent woodland

Vegetation: Open forest dominated by River Red Gum along creekline (RE1.3.7) over native grasses mixed with exotic Annual Mission Grass. Adjacent woodland dominated by *Eucalyptus leucophylla* (RE1.11.2) over *Triodia* sp.

Habitat values: No water present at creekline. Patchy dense shrub layer of *Acacia* spp. in adjacent woodland. Sparse mistletoe presence in River Red Gums. Abundant tree hollows along creekline.

Disturbance evidence: Light cattle impact along creekline with impacts on grass layer (foraging) and some bank erosion but generally restricted to track/crossing point. Some evidence of past localised mineral extraction activity in woodland area. Little evidence of recent fire. Annual Mission Grass (exotic species) dominant along creek edge.

Bird observations: Only four species recorded at time of survey although timing sub-optimal (midday).



View north along drainage line

Site name: Bird count 3

Land form: flat area between drainage lines

Vegetation: Mixture of Snappy Gum *eucalyptus lucophloia* open woodland (RE1.11.2a) and *E. leucophylla/Corymbia terminalis* woodland (RE1.11.3) over *Triodia* sp.

Habitat values: Large creek and minor drainage line border survey area. Patchy but dense shrub layer present. River Red Gum present on large creek and Black Teatree *Melaleuca bracteata* present on creeklines. Sparse mistletoe presence in River Red Gums. Patchy small rockpiles on minor creekline and through survey area with some crevice formation. Native grasses present along edge of drainage areas.

Disturbance evidence: No evidence of recent fire although *Triodia* hummocks generally small/immature. Evidence of cattle grazing along major creekline where Annual Mission Grass present.

Bird observations: 13 bird species recorded.

Painted Honeyeater (*Grantiella picta*) survey site descriptions, May 2016



View northeast along drainage line between hills

Site name: Bird count 4

Land form: undulating low hills

Vegetation: Mixture of very sparse Snappy Gum open woodland over *Triodia* sp. with *E. leucophylla/Corymbia terminalis* woodland (RE1.11.3) dominating on/close to gully line.

Habitat values: Very open woodland away from gully lines where Black Teatree also present. No mistletoe observed. Patchy small rockpiles throughout survey area although little crevice formation observed.

Disturbance evidence: No evidence of recent fire although *Triodia* hummocks generally small/immature. Little evidence of cattle presence.

Bird observations: Only 6 bird species recorded.



View west along Mica Creek

Site name: Bird count 5

Land form: Mica Creek

Vegetation: Open forest dominated by River Red Gum and *Lophostemon grandiflorus* along creekline (RE1.3.7), with patchy lower tree/shrub layer over dense weedy ground layer.

Habitat values: Braided creek habitat area at survey point (approx. 150 m wide). Pooled water present downstream of site at crossing area. Patchy but dense lower tree/shrub layer present providing good shelter/foraging resource for small birds. Moderate mistletoe presence in River Red Gums. Abundant tree hollows present.

Disturbance evidence: Light cattle impact along creekline with some impact on grass layer (foraging). No evidence of recent fire. Dense patchy ground layer (on raised areas) dominated by exotic Annual Mission Grass and Noogoora Burr *Xanthium strumarium*.

Bird observations: Diverse site with 21 bird species recorded, some in high abundance. Likely due to local relative resource diversity within landscape. Gilbert's Dragon also observed.



View south over survey site

Site name: Bird count 6

Land form: Drainage flats between hills/ridgelines

Vegetation: Mixture of Snappy Gum open woodland (RE1.11.2a) and *E. leucophylla/Corymbia terminalis* woodland (RE1.11.3) over *Triodia* sp.

Habitat values: Minor (dry) drainage area crosses through survey area. Dense shrub layer around drainage area dominated by *Acacia monticola*. Very sparse mistletoe presence in *C. terminalis*. *Triodia* ground layer well developed with mature hummocks present.

Disturbance evidence: No evidence of recent fire in area and little attraction for cattle grazing. Tracks, some evidence of previous earthworks and human/vehicle debris present around area.

Bird observations: 15 bird species recorded. Relatively high abundance and diversity of honeyeaters present due to flowering gums in area.

Painted Honeyeater (*Grantiella picta*) survey site descriptions, May 2016



Site name: Bird count 6

Land form: Creekline

Vegetation: Open forest dominated by River Red Gum along creekline (RE1.3.7) over native grasses mixed with exotic Annual Mission Grass. Adjacent woodland dominated by *Eucalyptus leucophylla* (RE1.11.2) over *Triodia* sp.

Habitat values: No water present at creekline. Patchy dense shrub layer of *Acacia* spp. in adjacent woodland. Sparse mistletoe presence in River Red Gums.

Disturbance evidence: Light cattle impact along creekline with impacts on grass layer (foraging) and some bank erosion but generally restricted to track/crossing point. Particularly large *C. aparrerinja* back from creekline. Annual Mission Grass (exotic species) dominant along creek edge.

Bird observations: 12 species recorded at time of survey despite timing being sub-optimal (midday).

This page has been intentionally left blank

Appendix O

Bird list (surveys and incidental)

This page has been intentionally left blank

Bird records within the Project footprint during surveys in May and June 2016 (includes site surveys and incidental records)

Family	Common name	Scientific name	Threatened status			Bioregion		
			N.T.	Qld	National	Davenport & Murchison Ranges / Tanami	Mitchell Grass Downs	Mount Isa Inlier
Acanthizidae	Inland Thornbill	<i>Acanthiza apicalis</i>	LC	LC	-	✓		
	Weebill	<i>Smicrornis brevirostris</i>	LC	LC	-	✓		✓
Accipitridae	Black Kite	<i>Milvus migrans</i>	LC	LC	-	✓	✓	✓
	Black-shouldered Kite	<i>Elanus axillaris</i>	LC	LC	-	✓		
	Brown Goshawk	<i>Accipiter fasciatus</i>	LC	LC	-		✓	✓
	Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>	LC	LC	-		✓	
	Spotted harrier	<i>Circus assimilis</i>	LC	LC	-	✓	✓	
	Swamp Harrier	<i>Circus approximans</i>	LC	LC	-	✓	✓	
	Wedge-tailed Eagle	<i>Aquila audax</i>	LC	LC	-	✓		✓
	Whistling Kite	<i>Haliastur sphenurus</i>	LC	LC	-	✓	✓	✓
Aegothelidae	Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	LC	LC	-		✓	✓
Anseranatidae	Magpie Goose	<i>Anseranas semipalmata</i>	LC	LC	-		✓	✓
Ardeidae	White-necked Heron (Pacific Heron)	<i>Ardea pacifica</i>	LC	LC	-		✓	✓
Artamidae	Australian Magpie	<i>Gymnorhina tibicen</i>	LC	LC	-			✓
	Black-faced Woodswallow	<i>Artamus cinereus</i>	LC	LC	-	✓		✓
	Little Woodswallow	<i>Artamus minor</i>	LC	LC	-	✓		✓
	Masked Woodswallow	<i>Artamus personatus</i>	LC	LC	-	✓	✓	✓
	Pied Butcherbird	<i>Cracticus nigrogularis</i>	LC	LC	-	✓		✓
	White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	LC	LC	-	✓	✓	
Burhinidae	Bush Stone-Curlew	<i>Burhinus grallarius</i>	LC	LC	-	✓		
Cacatuidae	Cockatiel	<i>Nymphicus hollandicus</i>	LC	LC	-			
	Galah	<i>Eolophus roseicapilla</i>	LC	LC	-	✓	✓	✓
	Little Corella	<i>Cacatua sanguinea</i>	LC	LC	-	✓		
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC	LC	-			✓
Campephagidae	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	LC	LC	-	✓	✓	✓
	White-bellied Cuckoo-shrike	<i>Coracina papuensis</i>	LC	LC	-			✓
	White-winged Triller	<i>Lalage sueurii</i>	LC	LC	-	✓		✓

Bird records within the Project footprint during surveys in May and June 2016 (includes site surveys and incidental records)

Family	Common name	Scientific name	Threatened status			Bioregion		
			N.T.	Qld	National	Davenport & Murchison Ranges / Tanami	Mitchell Grass Downs	Mount Isa Inlier
Cinclosomatidae	Chiming Wedgebill	<i>Psophodes occidentalis</i>	LC	LC	-	✓		
Cisticolidae	Golden-headed Cisticola	<i>Cisticola exilis</i>	LC	LC	-	✓		
Climacteridae	Black-tailed Treecreeper	<i>Climacteris melanura</i>	LC	LC	-			✓
Columbidae	Common Bronzewing	<i>Phaps chalcoptera</i>	LC	LC	-			
	Crested Pigeon	<i>Ocyphaps lophotes</i>	LC	LC	-	✓	✓	
	Diamond Dove	<i>Geopelia cuneata</i>	LC	LC	-	✓	✓	
	Flock Bronzewing	<i>Phaps histrionica</i>	NT	LC	-	✓		
	Peaceful Dove	<i>Geopelia placida</i>	LC	LC	-			✓
	Spinifex Pigeon	<i>Geophaps plumifera</i>	LC	LC	-			✓
Corvidae	Australian Raven	<i>Corvus coronoides</i>	LC	LC	-			✓
Cuculidae	Horsefield's Bronze Cuckoo	<i>Chrysococcyx basalis</i>	LC	LC	-	✓		✓
	Pallid Cuckoo	<i>Cacomantis pallidus</i>	LC	LC	-	✓		✓
	Pheasant Coucal	<i>Centropus phasianinus</i>	LC	LC	-	✓		
Estrildidae	Painted Finch	<i>Emblema pictum</i>	LC	LC	-			✓
	Zebra Finch	<i>Taeniopygia guttata</i>	LC	LC	-	✓	✓	✓
Eurostopdidae	Spotted Nightjar	<i>Eurostopodus argus</i>	LC	LC	-	✓		✓
Falconidae	Nankeen Kestrel	<i>Falco cenchroides</i>	LC	LC	-	✓	✓	✓
	Brown Falcon	<i>Falco berigora</i>	LC	LC	-	✓	✓	✓
	Grey Falcon	<i>Falco hypoleucos</i>	VU	VU	-	✓	✓	
Gruidae	Brolga	<i>Grus rubicunda</i>	LC	LC	-		✓	
Halcyonidae	Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	LC	LC	-	✓		✓
	Sacred Kingfisher	<i>Todiramphus sanctus</i>	LC	LC	-	✓		
Maluridae	Kalkadoon Grasswren	<i>Amytornis ballarae</i>	-	LC	-			✓
	Variegated Fairy-wren	<i>Malurus lamberti</i>	LC	LC	-	✓		
Meliphagidae	Banded Honeyeater	<i>Cissomela pectoralis</i>	LC	LC	-	✓	✓	
	Black Honeyeater	<i>Sugomel niger</i>	LC	LC	-	✓		
	Black-chinned Honeyeater	<i>Melithreptus gularis</i>	LC	LC	-	✓		

Bird records within the Project footprint during surveys in May and June 2016 (includes site surveys and incidental records)

Family	Common name	Scientific name	Threatened status			Bioregion		
			N.T.	Qld	National	Davenport & Murchison Ranges / Tanami	Mitchell Grass Downs	Mount Isa Inlier
Meliphagidae	Brown Honeyeater	<i>Lichmera indistincta</i>	LC	LC	-	✓		✓
	Crimson Chat	<i>Epthianura tricolor</i>	LC	LC	-	✓		
	Grey-fronted Honeyeater	<i>Ptilotula plumula</i>	LC	LC	-	✓		✓
	Grey-headed Honeyeater	<i>Ptilotula keartlandi</i>	LC	LC	-	✓		✓
	Little Friarbird	<i>Philemon citreogularis</i>	LC	LC	-			✓
	Pied Honeyeater	<i>Certhionyx variegatus</i>	LC	LC	-		✓	
	Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>	LC	LC	-	✓		
	Silver-crowned Friarbird	<i>Philemon argenticeps</i>	LC	LC	-			✓
	Singing Honeyeater	<i>Gavicalis virescens</i>	LC	LC	-	✓		✓
	Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	LC	LC	-			✓
	White-plumed Honeyeater	<i>Ptilotula penicillata</i>	LC	LC	-		✓	✓
	Yellow-throated Miner	<i>Manorina flavigula</i>	LC	LC	-	✓	✓	✓
	Yellow-tinted Honeyeater	<i>Ptilotula flavescens</i>	-	LC	-			✓
Meropidae	Rainbow Bee-eater	<i>Merops ornatus</i>	LC	LC	-			✓
Monarchidae	Magpie-Lark	<i>Grallina cyanoleuca</i>	LC	LC	-			✓
Nectariniidae	Mistletoebird	<i>Dicaeum hirundinaceum</i>	LC	LC	-			✓
Otididae	Australian Bustard	<i>Ardeotis australis</i>	NT	LC	-	✓	✓	
Pachycephalidae	Crested Bellbird	<i>Oreoica gutturalis</i>	LC	LC	-	✓		✓
	Grey Shrike-thrush	<i>Colluricincla harmonica</i>	LC	LC	-	✓		✓
	Rufous Whistler	<i>Pachycephala rufiventris</i>	LC	LC	-	✓		✓
Pardalotidae	Red-browed Pardalote	<i>Pardalotus rubricatus</i>	LC	LC	-	✓		✓
	Striated Pardalote	<i>Pardalotus striatus</i>	LC	LC	-			✓
Petroicidae	Hooded Robin	<i>Melanodryas cucullata</i>	LC	LC	-	✓		✓
	Jacky Winter	<i>Microeca fascinans</i>	LC	LC	-			✓
Phasianidae	Brown Quail	<i>Coturnix ypsilophora</i>	LC	LC	-	✓		
	Stubble Quail	<i>Coturnix pectoralis</i>	LC	LC	-	✓		
Pomatostomidae	Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	LC	LC	-			✓

Bird records within the Project footprint during surveys in May and June 2016 (includes site surveys and incidental records)

Family	Common name	Scientific name	Threatened status			Bioregion		
			N.T.	Qld	National	Davenport & Murchison Ranges / Tanami	Mitchell Grass Downs	Mount Isa Inlier
Psittacidae	Australian (Cloncurry) Ringneck	<i>Barnardius zonarius macgillivrayi</i>	LC	LC	-			✓
	Budgerigar	<i>Melopsittacus undulatus</i>	LC	LC	-	✓		✓
	Red-winged Parrot	<i>Aprosmictus erythropterus</i>	LC	LC	-	✓		
Ptilonorhynchidae	Great Bowerbird	<i>Chlamydera nuchalis</i>	LC	LC	-			✓
Rhipiduridae	Willie Wagtail	<i>Rhipidura leucophrys</i>	LC	LC	-	✓	✓	✓
Turnicidae	Little Button-quail	<i>Turnix velox</i>	LC	LC	-	✓	✓	
	Red-chested Button-quail	<i>Turnix pyrrhothorax</i>	LC	LC	-	✓		

Key: Northern Territory (N.T.); Queensland (Qld); Vulnerable (VU); Near Threatened (NT); Least Concern (LC); no listing (-); Species was recorded (✓)

Appendix P

Migratory species likelihood of occurrence assessment

This page has been intentionally left blank

Migratory species likelihood analysis

This likelihood of occurrence assessment identifies which federally-listed migratory species have potential to occur within the Project footprint. The following procedure was used to determine the likelihood of occurrence of migratory species:

- 1) A search for MNES along the proposed pipeline route and within a 50 km buffer was undertaken using the Protected Matters Search Tool on 9 May 2016 (see Appendix C).
- 2) The ecology, distribution and survey records of each of the species recorded in Step 1 were examined along with habitat types within the Project footprint.
- 3) Using that information, species are allocated one of the following categories:
 - HIGH – there are recent records of the species within the Project footprint.
 - MEDIUM – core habitat for the species occurs within the Project footprint but there are no records.
 - LOW – there is no core habitat for the species within the Project footprint; however, the species may be present on occasion.
 - NONE – there is strong evidence that this species will not occur within the Project footprint.

It should be noted that resultant likelihood rankings may differ from those assigned in the EPBC Protected Matters Search Report because criteria in this assessment considers habitat present within refined project area, whereas the EPBC Report utilises coarser-scale filters.

Although migratory, the Curlew Sandpiper is considered in the threatened species section as the species is listed as Critically Endangered under the *EPBC Act*.

Note: For many threatened species, the Atlas of Living Australia provides 'likely' and 'possible' modelled expert distributions. These distributions are referred to throughout this document and mostly come from the Species of National Environmental Significance Database maintained by the federal Department of the Environment.

The location of some threatened species records from the Atlas of Living Australia has been generalised to 0.1 degree (introducing a location variance of up to 11 km) due to concerns that revealing the actual location may lead to poaching. Spatially-generalised records have been considered in this assessment; however, use of these records has been noted where relevant.

MIGRATORY SPECIES LIKELIHOOD ANALYSIS		
Species	Details	Likelihood of occurrence within the Project footprint
<p>Fork-tailed Swift <i>Apus pacificus</i></p>	<p>Habitat: Almost exclusively aerial. Mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh (Higgins 1999).</p> <p>Distribution: Non-breeding visitor to all states and territories of Australia. Breeds in Siberia and migrates southward during the northern winter (Higgins 1999). Within Queensland, there are scattered records in the Gulf Country, and a few records on Cape York Peninsula. In the north-east region there are many records east of the Great Divide from near Cooktown and south to Townsville (Higgins 1999).</p> <p>Records: 14 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are recent records of the species within the 50 km buffer. • <i>Expert distribution (likely)</i> (Commonwealth of Australia 2016) incorporates the entire Project footprint. • Given the broad distribution and wide ranging nature of this species, it is likely to forage in the air space over the Project footprint on occasion.
<p>Barn Swallow <i>Hirundo rustica</i></p>	<p>Habitat: Prefers open coastal lowlands, often near water and populated areas where it perches on artificial substrate. Also found in or over freshwater wetlands, Melaleuca woodland, mesophyll shrub thickets and tussock grassland.</p> <p>Distribution: Occurs patchily across the north coast of mainland Australia from the Pilbara region of WA to Fraser Island in Qld (DOE 2016a).</p> <p>Records: A single record from 1989 near Lake Moondarra.</p>	<p>LOW</p> <ul style="list-style-type: none"> • The species distribution does not extend over the Project footprint. • Derived <i>expert distribution</i> (BirdLife International 2016) is not intersected by the Project footprint. • The patchy distribution along coastal areas is not consistent with the habitat within or location of the Project footprint. • There are no records from within the Project footprint.
<p>Rainbow Bee-eater <i>Merops ornatus</i></p>	<p>Habitat: Occurs mainly in open forests and woodlands, farmland and areas of human habitation (Higgins 1999).</p> <p>Distribution: Widely distributed throughout Australia, eastern Indonesia, Papua New Guinea, the Bismarck Archipelago and, rarely, the Solomon Islands. Majority of the global population breeds in Australia (Higgins 1999).</p> <p>Records: 697 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are multiple records from across the Project footprint. • Core habitat exists within the Project footprint for the species.
<p>Grey Wagtail <i>Motacilla cinerea</i></p>	<p>Habitat: Has a strong association with water and has been detected on margins of wetlands, watercourses, lakes and marshes (DOE 2015).</p> <p>Distribution: A rare vagrant to Australia (Morcombe 2003) between October and March. Occurrences in Australia have been in Cape York and the NT Top End, with two records around Alice Springs and isolated records along the southern Australia coast (DOE 2015).</p> <p>Records: None</p>	<p>LOW</p> <ul style="list-style-type: none"> • No records of the species within the Project footprint. Records of the species are predominately from coastal regions. • Distribution of the species is well outside the Project footprint. • Core habitat is not present within the Project footprint.

MIGRATORY SPECIES LIKELIHOOD ANALYSIS		
Species	Details	Likelihood of occurrence within the Project footprint
Yellow Wagtail <i>Motacilla flava</i>	<p>Habitat: Habitat requirements vary but typically include a proximity to water. Typically favours open areas such as grasslands and wetland edges but also man-made open areas such as sports grounds, sewage ponds and farmlands (DOE 2015).</p> <p>Distribution: Rare summer migrant to Australia (Morecombe 2003), typically found around coastal regions across northern Australia from the Pilbarra to southern Qld but has occurred in coastal Victoria.</p> <p>Records: One record from Lake Moondarra.</p>	<p>LOW</p> <ul style="list-style-type: none"> • A single record from Lake Moondarra (outside the Project footprint). • Distribution is largely confined to coastal areas. • There are few records in Australia. • No core habitat is located within the Project footprint; however, suitable open wet areas could be present during the wet summer season.
Great Egret <i>Ardea alba</i>	<p>Habitat: Occurs on a variety of habitat types including wetlands, flooded pastures, dams, estuaries, mangroves and reefs (Morecombe 2003).</p> <p>Distribution: Broadly distributed across Australia.</p> <p>Records: 435 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are multiple records from across the Project footprint.
Cattle Egret <i>Ardea ibis</i>	<p>Habitat: Occurs on a variety of habitat types including flooded pastures, dam edges, mudflats and open wetlands (Morecombe 2003).</p> <p>Distribution: Broadly distributed across Australia.</p> <p>Records: 113 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are multiple records from across the Project footprint.
Sharp-tailed Sandpiper <i>Calidris acuminata</i>	<p>Habitat: Prefers muddy edges of shallow wetlands, with inundated low vegetation (DOE 2016b).</p> <p>Distribution: In Qld, widely distributed along the coast but are sparsely distributed inland. One particular inland location is Lake Moondarra area near Mt Isa.</p> <p>Records: 110 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • There are 72 associated with Lake Moondarra or the Mount Isa Mines tailings dam and are outside of the Project footprint. • There are two records from the western end of the Project footprint that are likely associated with small dams which will not be intersected by the Project footprint. • Preferred habitat is not typical of the Project footprint; only marginal habitat is likely to be present in wet seasons.
Red-necked Stint <i>Calidris ruficollis</i>	<p>Habitat: Found mostly in coastal areas. Sometimes occur inland at water bodies and water treatment facilities. Mostly forage on bare wet mud on intertidal mudflats or sandflats, or in very shallow water and roosts on sheltered beaches (DOE 2016c).</p> <p>Distribution: Recorded in all coastal regions, and found inland in all states when conditions are suitable.</p> <p>Records: 22 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • Most records are associated with Lake Moondarra or the Mount Isa Mines tailings dam. • The record from near Tennant Creek is from the Sewage Ponds. • The record from Barkly Station is from a swamp which will not be intersected by the Project footprint. • There is no suitable habitat within the Project footprint.

MIGRATORY SPECIES LIKELIHOOD ANALYSIS		
Species	Details	Likelihood of occurrence within the Project footprint
Lesser Sand Plover <i>Charadrius mongolus</i>	<p>Habitat: Feeds mostly on extensive, freshly-exposed areas of intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in saltworks (DOE 2016d).</p> <p>Distribution: Widespread in coastal regions. Relative to the project location, mainly occurs in south-eastern parts of the Gulf of Carpentaria though occasionally also inland.</p> <p>Records: 3 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The only three records are close to Mt Isa and Lake Moondarra. • Given that this is a predominately coastal species, these records are likely incidental. • There is no suitable habitat within the Project footprint.
Oriental Plover <i>Charadrius veredus</i>	<p>Habitat: After moving from coastal environments, usually inhabit flat, open, grasslands, where short grass is interspersed with hard, bare ground (Boekel 1980; Carruthers 1966; Pedler 1982)</p> <p>Distribution: Non-breeding visitor to Australia, where the species occurs in both coastal and inland areas, mostly in northern Australia. Found on black soil plains in the Northern Territory and Queensland.</p> <p>Records: 29 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are records from approximately 3 km north of the construction ROW. • The distribution extends across much of the Project footprint. • The hummock grasslands and open woodlands of the Project footprint contain sufficient open areas and bare ground to support inhabitation by this species.
Oriental Pratincole <i>Glareola maldivarum</i>	<p>Habitat: Non-breeding in Australia, usually inhabits open plains, floodplains or short grassland, often with extensive bare areas (DOE 2016e). Often occurs near inland water.</p> <p>Distribution: Most of the migratory population is thought to spend the non-breeding season in Australia (Higgins & Davies 1996).</p> <p>Records: 28 records within 50 km of the pipeline route.</p>	<p>HIGH</p> <ul style="list-style-type: none"> • There are numerous records of near the Project footprint, although mostly associated with Lake Moondarra. • There is suitable open plains habitat through to the Project footprint.
Black-tailed Godwit <i>Limosa limosa</i>	<p>Habitat: Strongly favours coastal habitat. Few inland records around waterbodies. Also uses lagoons in sewage farms and saltworks (Higgins & Davies 1996).</p> <p>Distribution: Found in all states and territories of Australia, prefers coastal regions and the largest populations are found on the north coast between Darwin and Weipa. Generally found in small numbers elsewhere including inland sites (Watkins 1993).</p> <p>Records: 19 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The records are from the Mt Isa region and are associated with Lake Moondarra or the Mount Isa Mines tailings dam (outside Project footprint). • There is no suitable habitat within the Project footprint.
Little Curlew <i>Numenius minutus</i>	<p>Habitat: Most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated (DOE 2016f).</p> <p>Distribution: Generally spend the non-breeding season in northern Australia from Port Hedland in WA to the Qld coast, with scattered inland records (DOE 2016f).</p> <p>Records: 17 records within 50 km of the pipeline route.</p>	<p>LOW</p> <ul style="list-style-type: none"> • There are no records from the Project footprint. The 10 recent records are from around Lake Moondarra (outside the Project footprint). • Limited, scattered inland records indicate a strong preference for coastal areas. • No core habitat is located within the Project footprint. Some seasonally suitable inundated areas are within the Project footprint the areas are expected to be used infrequently if at all.

MIGRATORY SPECIES LIKELIHOOD ANALYSIS		
Species	Details	Likelihood of occurrence within the Project footprint
Whimbrel <i>Numenius phaeopus</i>	<p>Habitat: Often found on the intertidal mudflats of sheltered coasts. It has been infrequently recorded using brackish lakes near coastal areas (DOE 2016g).</p> <p>Distribution: Regular migrant to Australia and New Zealand, with a primarily coastal distribution. There are also scattered inland records in all regions (Garnett et al 2011).</p> <p>Records: No records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • There are no records within the Project footprint. • There is no suitable habitat within the Project footprint. • The species has a strong association with coastal areas.
Osprey <i>Pandion haliaetus</i>	<p>Habitat: Occur in coastal habitats and terrestrial wetlands. Mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Marchant & Higgins 1993; Olsen et al. 1995). Species requires extensive areas of open fresh, brackish or saline water for foraging, where they feed mainly on fish (Marchant and Higgins, 1993).</p> <p>Distribution: Breeding range extends around the northern coast of Australia. Non-breeding range is nearly continuous along the north Australia coast (DOE 2016h).</p> <p>Records: 14 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The Moondarra Lake area to the north East of Mt Isa provides open water habitat for <i>Pandion cristatus</i>. • There are recent records from this lake. • However, no suitable habitat exists within the Project footprint.
Pacific Golden Plover <i>Pluvialis fulva</i>	<p>Habitat: Usually inhabits coastal habitats, though it occasionally occurs around inland wetlands especially those with muddy margins (DOE 2016i)</p> <p>Distribution: Widespread in coastal regions, though there are also a number of inland records (in all states), sometimes far inland and usually along major river systems (DOE 2016i).</p> <p>Records: 13 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The majority of records are from Lake Moondarra or the Mount Isa Mines tailings dam. • There is an old (1958) record from 10 km south of the Project footprint. • The species has a strong association with coastal habitats. • There is no suitable habitat within the Project footprint.
Wood Sandpiper <i>Tringa glareola</i>	<p>Habitat: Uses well-vegetated, shallow, freshwater wetlands as typical habitat. Forages on mud at the edges of wetlands and roosts by loafing on low, grassy hillocks in flooded meadows or perched low in trees and on fences (Higgins & Davies 1996).</p> <p>Distribution: Largest numbers recorded in north-west Australia, with all areas of national importance located in WA (Watkins 1993). In Qld, sparsely scattered records south of 17°S.</p> <p>Records: 82 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> • The records near Mt Isa are associated with Lake Moondarra or the Mount Isa Mines tailings dam (outside the Project footprint). • The records from Tennant Creek are from the sewerage works (outside the Project footprint). • There is no suitable habitat intersected by the Project footprint.
Common Greenshank <i>Tringa nebularia</i>	<p>Habitat: Found in a wide range of wetland habitats of varying salinity. Inland, utilises permanent and seasonal wetlands including man-made areas but prefers clay substrate to sand (Morecombe 2003)</p> <p>Distribution: Found across much of Australia including inland areas of NT and Qld. Within the NT, the species is scattered including records from the Barkly Tableland and Tanami region. In Queensland there are sporadic</p>	<p>LOW</p> <ul style="list-style-type: none"> • No records from within the Project footprint (one record approximately 10 km south near KP 60). • Numerous records near Lake Moondarra and Mount Isa Mines tailings dam (outside construction ROW).

MIGRATORY SPECIES LIKELIHOOD ANALYSIS		
Species	Details	Likelihood of occurrence within the Project footprint
	inland records including from around Mt Isa. Records: 63 records within 50 km of the pipeline route.	<ul style="list-style-type: none"> Marginally suitable habitat may be present in some wet seasons.
Marsh Sandpiper <i>Tringa stagnatilis</i>	<p>Habitat: Permanent or ephemeral wetlands. In north Australia, prefers intertidal mudflats (Higgins & Davies 1996).</p> <p>Distribution: Found on coastal and inland wetlands throughout Australia and is widespread in coastal Qld.</p> <p>Records: 89 records within 50 km of the pipeline route.</p>	<p>NONE</p> <ul style="list-style-type: none"> The records near Mt Isa are associated with Lake Moondarra or the Mount Isa Mines tailings dam (outside the Project footprint). The records from Tennant Creek are from the sewerage works (outside the Project footprint). There is no suitable habitat within the Project footprint.

References used in the migratory species likelihood analysis

- BirdLife International 2016, Species factsheet: *Hirundo rustica*, viewed online, <http://www.birdlife.org>
- Boekel C 1980, Birds of Victoria River Downs Station and of Yarralin, Northern Territory. Part 1. *Australian Bird Watcher*, 8, pp. 171-193
- Commonwealth of Australia 2016, Species of National Environmental Significance, viewed online, <http://www.environment.gov.au/science/erin/databases-maps/snes>.
- Carruthers RK 1966, Waders in the Gulf Country, *Australian Bird Watcher*, 2, pp. 211-214
- Department of the Environment 2015, Draft referral guideline for 14 birds listed as migratory species under the *EPBC Act*, Department of the Environment, Canberra, viewed online 1 June 2016, <http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds>
- Department of the Environment 2016a, *Hirundo rustica* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>
- Department of the Environment 2016b, *Calidris acuminata* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>
- Department of the Environment 2016c, *Calidris ruficollis* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>
- Department of the Environment 2016d, *Charadrius mongolus* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Department of the Environment 2016e, *Glareola maldivarum* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Department of the Environment 2016f, *Numenius minutus* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Department of the Environment 2016g, *Numenius phaeopus* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Department of the Environment 2016h, *Pandion haliaetus* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Department of the Environment 2016i, *Pluvialis fulva* in Species Profile and Threats Database, Department of the Environment, Canberra, viewed online, <http://www.environment.gov.au/sprat>.
- Garnett ST, Szabo JK & Dunston G 2011, Action Plan for Australian Birds 2010, CSIRO Publishing, Melbourne, Victoria.
- Higgins, P.J. (ed.) (1999). *Handbook of Australian, New Zealand and Antarctic Birds. Volume Four - Parrots to Dollarbird*. Melbourne: Oxford University Press.

References used in the migratory species likelihood analysis

- Higgins PJ & Davies SJJF (eds) 1996, Handbook of Australian, New Zealand and Antarctic Birds. Volume 3 - Snipe to Pigeons, Oxford University Press, Melbourne, Victoria.
- Marchant S & Higgins PJ (eds.) 1993, Handbook of Australian, New Zealand and Antarctic Birds. Volume 2 - Raptors to Lapwings, Oxford University Press, Melbourne, Victoria.
- Morecombe, M 2003, Field Guide to Australian Birds, Pascal Press, Sydney.
- Olsen, PD, Fuller, P & Marples, TG 1993, 'Pesticide related egg-shell thinning in Australian raptors' *Emu*, 93: pp.1-11.
- Olsen P 1995, *Australian Birds of Prey*, University of NSW Press, Sydney.
- Pedler L 1982, An Oriental Plover in the Mid-north of South Australia, *South Australian Ornithologist*, 28, pp. 207.
- Watkins D 1993, A national plan for shorebird conservation in Australia, *RAOU Report Series*, 90.

This page has been intentionally left blank