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Duncan-Gordon Downs Road Upgrade – Stage 1

Desktop Flora and Vegetation Assessment

May 2020

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Revisions

Revision Number	Revision Date	Description of Key Changes	Section / Page No.
Draft v1	20/05/2020	Draft Document for Review	-
v1	27/05/2020	Version for issue	-

1 SUMMARY

The desktop flora and vegetation assessment characterised and mapped the vegetation types present within the Duncan Gordon Downs Road Upgrade (DGDRU) Stage 1 Development Envelope based on desktop information, database searches and observations from a site visit. Eight vegetation types were mapped within the Development Envelope. Estimates of the regional extents of these vegetation types were calculated by extrapolating to a 50km radius based on Land System or Pre-European Vegetation Association mapping by the Department of Agriculture and Food (DPIRD 2019a; DPIRD 2019b).

All vegetation types recorded were found to be common within the 50km Desktop Assessment Area, with the exception of the V02 (Hummock grassland; thought to be an inclusion from nearby land systems which occurs near drainage lines). Estimated extent for the V02 vegetation type is 597 ha within a 50km radius of the Development Envelope.

A review of desktop information sources for Threatened and Priority flora and ecological communities was also conducted. No Threatened flora listed under the *Biodiversity Conservation Act 2016* or the *Environmental Protection and Biodiversity Conservation Act 1999* has been previously recorded in the region and none is likely to occur. Six priority flora are considered likely to occur based on habitat preferences. One Priority Ecological Community (PEC), Kimberley Vegetation Association 850 (Priority 3) was recorded in desktop searches and intersects the Development Envelope.

2 INTRODUCTION

2.1 Purpose

This flora and vegetation desktop assessment provides an assessment of vegetation types, their estimated regional representation, significant flora records and their likelihood of occurrence.

2.2 Project Details

Duncan Road commences at Halls Creek town site and continues south-east towards the Northern Territory border. Duncan Road and Gordon Downs Road Upgrade Project is 166 km in length and will be staged over a 3-4 year period, finishing at Ringer Soak (Kundat Djaru Community), south east of Halls Creek.

During prolonged rainfall periods, the community of Ringer Soak is often cut off by road from Halls Creek for several weeks. The Gordon Downs Road is the only road into the community. This is of particular concern for the well being of the community if the road is not urgently upgraded, especially given current health concerns. In addition, Northern Minerals are developing a rare earths mine south-east of Ringer Soak and plan to truck supplies to the mine and mined ore from the mine to the Great Northern Highway in Halls Creek. The current road is unsealed and will require upgrade works to support the planned traffic to ensure it is protected. The road drainage needs to be re-established as it does not adequately manage the heavy rainfall events that occur in the Kimberley, often resulting in the roads being damaged. In addition, several sections require minor realignment to ensure safety outcomes of the completed road.

The Duncan and Gordon Downs Road are managed by the Shire of Halls Creek. Main Roads WA has been engaged in the capacity of a construction contractor to assist the Shire in constructing the upgrades.

The proposed 2020 works program will involve works between SLK 80-116 on the Duncan Road, and between SLK 0 and 52.5 on the Gordon Downs Road. A number of material areas are also under consideration to support the 2020 works program. This assessment is for a Development area of 230 ha as shown in Figure 1. A 50km desktop study area was also included in the assessment.

The proposed clearing area is shown in Figure 2 and is detailed in Table 1.

Table 1. Work Areas and Estimated Clearing Breakdown

Work Area	Estimated Clearing	Description
Road Upgrades		
Duncan Road SLK 85.29 – 86.07	0.4 ha	Minor realignment and floodway upgrade works required for safety purposes Minor realignment and floodway upgrade works required for safety purposes
Duncan Road SLK 114.26 – 116.04	1.7 ha	
Gordon Downs Road SLK 34.61 – 34.98	0.4 ha	Minor realignment works required for safety purposes
Gordon Roads Road SLK 39.0 – 52.47	17.0 ha	Minor upgrades to road formation and drainage on existing alignment, with minor realignment in select areas.
Material Areas		
Gordon Downs Road SLK 0.74	15.7 ha	Expansion of existing pits and extraction of materials for use on the Project
Gordon Downs Road SLK 13.12	7.8 ha	
Gordon Downs Road SLK 35.54 (includes a Turkey's Nest Construction Water Dam Site)	5.4 ha	
Gordon Downs Road SLK 39.85	2.0 ha	
Gordon Downs Road SLK 43.49	2.2 ha	
Gordon Downs Road SLK 50.35	8.7 ha	
TOTAL	61.3 ha	

* Works will also occur on existing cleared areas (33.7 ha).

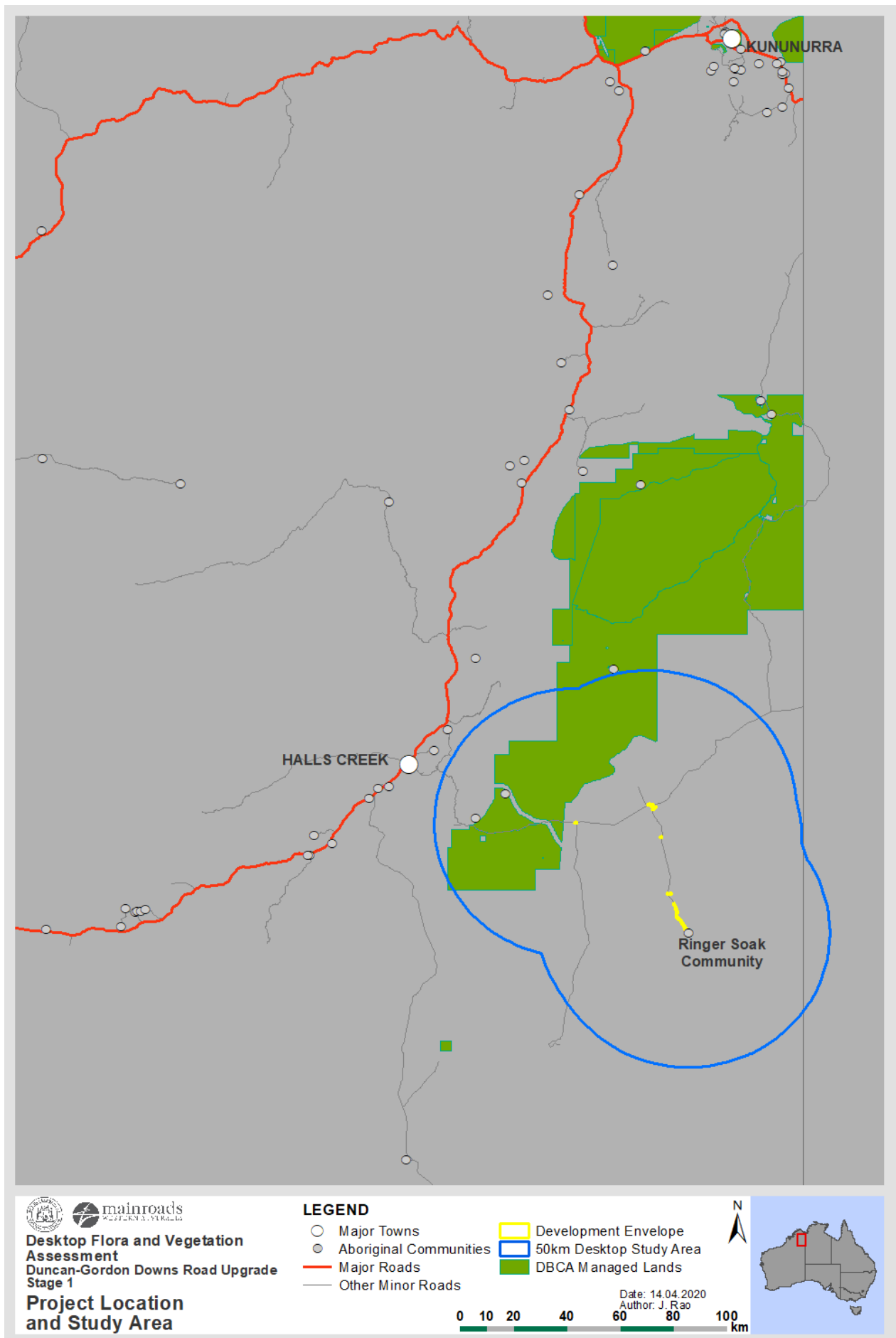


Figure 1. Project Location and Study Area

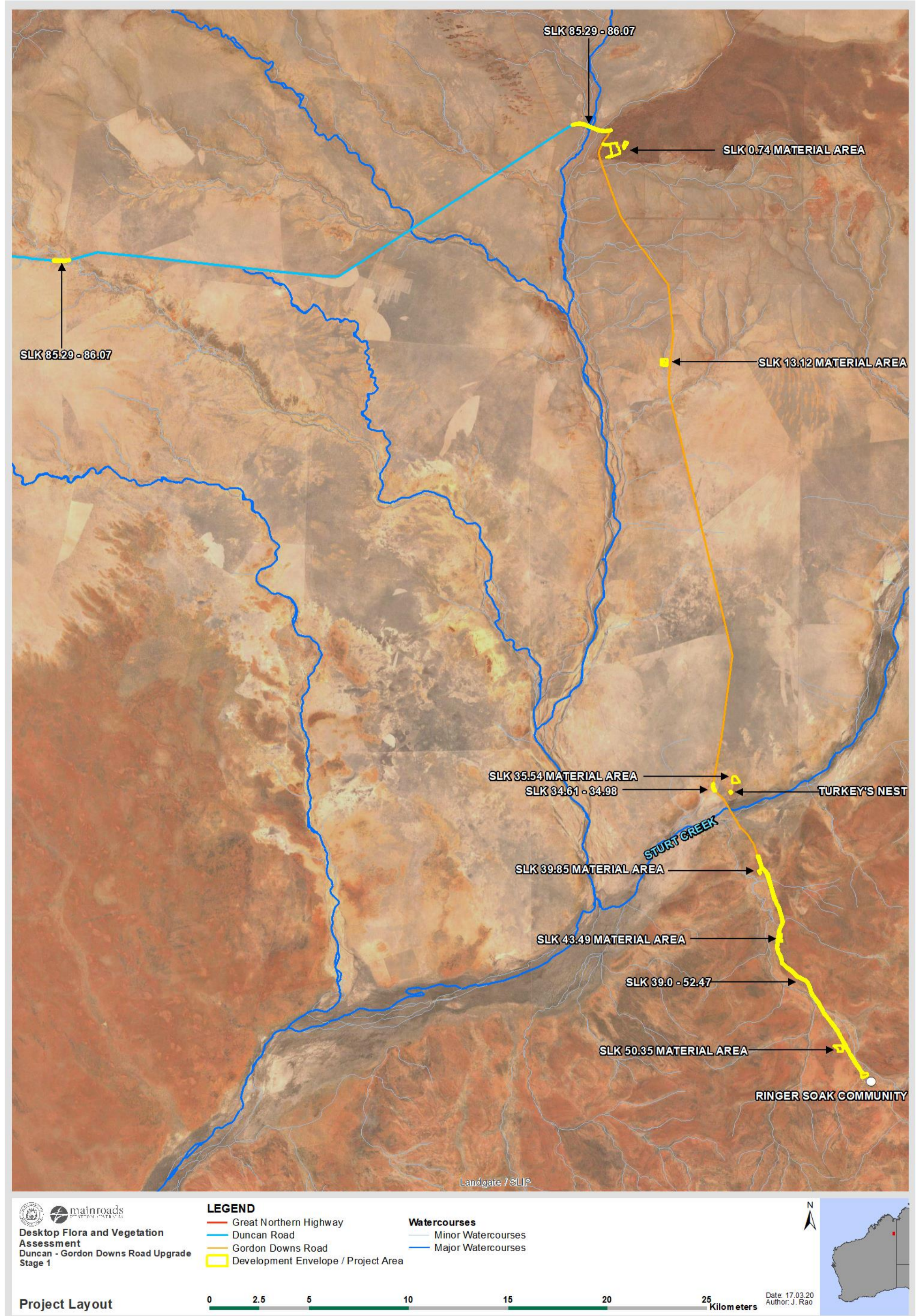


Figure 2. Project Layout

3 ASSESSMENT METHOD

The methods used for this assessment are as follows:

Desktop Assessment

1. Characterisation and mapping of vegetation types within the Development Envelope, based on desktop information supplemented by a site assessment (Section 5);
2. Thorough database searches to identify species that have been recorded within the 50km Desktop Assessment Area, or could potentially occur based on available modelled distributions (Section 6);

Site Assessment

3. A site assessment was conducted by JJ Rao, Main Roads Kimberley Environment Officer from 1 - 2 April 2020 to primarily to document fauna values. Information on flora and vegetation was also collected during this visit.

Impact Assessment

4. Likelihood of occurrence assessment based on the available habitats and known preferences of species, using current and historical surveys where relevant (Section 7); and

3.1 Information Sources

Information used in this assessment were collated across a number of sources listed in Table 2.

3.2 Limitations

Key limitations associated with this assessment are:

1. No flora fieldwork was conducted, including searches for Threatened or Priority flora were carried out. Likelihood of occurrence based on best available information.
2. No statistical analysis was carried out to determine vegetation types. Types were mapped based on observations during a site assessment carried out in April 2020.
3. Due to health and safety management for the COVID-19 pandemic, a 500m radius around the Ringer Soak Community was not visited during the site assessment. Vegetation mapping in this area was carried out by extrapolation.

Table 2. Desktop Information Sources

Title	Source	Relevance	
Historical Records / Surveys			
1	EPBC Protected Matters Search Tool (PMST)	DAWE 2020a	Search of Federal databases on modelled distribution of protected matters (a 50km radius of the Development Envelope was used).
2	NatureMAP	DBCA 2020a	Database search of known State records (limited to Kingdom Plantae). A 40km radius was used on a set of six points along the Development Envelope to reduce the likelihood of missed records from the 20km limit on line searches.
3	WA Herbarium and Threatened and Priority Flora List	DBCA 2020b	GIS Database Search from the DBCA, based on a 50km radius of the Development Envelope. Supplements the NatureMap results, using a larger search area.
4	Priority Ecological Communities for Western Australia Version 29	DBCA 2020c	Detailed listings of all Priority Ecological Communities (PECs) in the Kimberley Region. Used to determine if mapped vegetation types may resemble listed PECs.
5	Threatened/Priority Ecological Communities Database	DBCA 2020d	Threatened Ecological Communities (TEC) and PEC search of DBCA databases within the 50km Desktop Assessment Area.
6	Browns Range Rare Earth Project Flora and Vegetation Impact Assessment	Outback Ecology 2014a	Flora and Vegetation survey undertaken for the Browns Range Rare Earth mine. The southern portion of the survey area overlaps the DGDRU Stage 1 Envelope (within the Winnecke System). Used to inform vegetation mapping.
7	Duncan/Gordon Downs Road Upgrade Project Level 1 Vegetation, Flora and Fauna Survey	Outback Ecology 2014b	Survey carried out by Outback Ecology in October 2014. Approximately 27% of the Development Envelope was surveyed. Used to inform habitat mapping.
Distribution Modelling / Habitat Mapping			
8	Atlas of Living Australia	ALA 2020	The ALA Database contains information from a variety of government and non-government sources. The level of reliability of ALA information is generally poorer than the government databases listed above. Therefore, ALA information is only used where other government information is unavailable.
9	Land Systems of the Kimberley Region	Schoknecht and Payne 2011; DPIRD 2019a	Detailed descriptions of vegetation, soils and landforms that are relevant in determining likelihood of occurrence.
10	Pre-European Vegetation Associations	DPIRD 2019b	Broad associations used for impact estimates and habitat mapping.
Site Assessments			
11	Duncan-Gordon Downs Road Stage 1 – Desktop Fauna Assessment	MRWA 2020	Site assessment to delineate fauna habitats. Some information used to inform vegetation types within the Development Envelope.

4 ENVIRONMENTAL CONTEXT

4.1 Broad Vegetation Associations

The Development Envelope intersects six pre-European Vegetation Associations, as described in Table 3 (Shepherd et al. 2002). These Associations are illustrated in Figure 3.

Table 3. Pre-European Vegetation Associations

Assoc. No	Description	Estimated Clearing	Extent within Dev. Envelope (% Impact)	Extent in 50km Desktop Area (% Impact)
91	Hummock grassland with sparse Eucalypts e.g. bloodwoods & snappy gum <i>Triodia</i> spp., <i>Corymbia dichromophloia</i> , <i>C. opaca</i> , <i>Eucalyptus leucophloia</i>	14.4 ha	57.9 ha	162,605 ha (>0.01% loss)
848	Hummock grassland with scattered bloodwoods & snappy gum <i>Triodia</i> spp., <i>Corymbia dichromophloia</i> , <i>Eucalyptus leucophloia</i>	15.6 ha	25.9 ha	190,997 ha (>0.01% loss)
850	Mainly Mitchell grass <i>Astrebla</i> spp.	13.7 ha	27.4 ha	271,398 ha (>0.01% loss)
894	Coolibah over ribbon/blue grass (rivers) <i>Eucalyptus microtheca</i> , <i>Chrysopogon</i> spp., <i>Dichanthium</i> spp.	1.4 ha	15.7 ha	41,873 ha (>0.01% loss)
895	Hummock grassland with scattered shrubs or mallee <i>Triodia</i> spp. <i>Acacia</i> spp., <i>Grevillea</i> spp. <i>Eucalyptus</i> spp.	15.5 ha	60.2 ha	141,808 ha (0.01% loss)
1893	Hummock grassland with scattered low trees over dwarf shrubs or mixed short grass and spinifex mixed species, <i>Triodia</i> spp.	0.7 ha	2.2 ha	21,154 ha (>0.01% loss)
Cleared Areas		33.7 ha	40.4 ha	N/A
TOTAL		61.3 ha	189.3 ha	

4.2 Soil Landscapes

The Development Envelope also intersects three Soil Landscapes (Land Systems). These are described in detail by Schoknecht and Payne (2011), and are detailed in Table 4 (Appendix 3).

Table 4. Soil Landscapes

Land System	Description	Estimated Clearing	Extent within Dev. Envelope (% Impact)	Extent in 50km Desktop Area (% Impact)
Geebee System	Lateritic plains with gravelly red soils supporting snappy gum and bloodwood sparse low woodlands over soft spinifex.	15.7 ha	30.6 ha	210,598 ha (>0.01% loss)
Winnecke System	Low linear or rounded hills, associated valley floors, and marginal sandplains, supporting soft spinifex hummock grasslands or sparse low snappy gum woodlands with spinifex.	30 ha	118 ha	201,365 ha (0.02% loss)
Inverway System	Level upland plains with black cracking clay soils supporting barley Mitchell grass grasslands.	15.6 ha	40.7 ha	303,812 ha (>0.01% loss)
Cleared Areas		33.7 ha	40.4 ha	N/A
TOTAL		61.3 ha	189.3 ha	

The extents of these Land Systems are also illustrated in Figure 4.

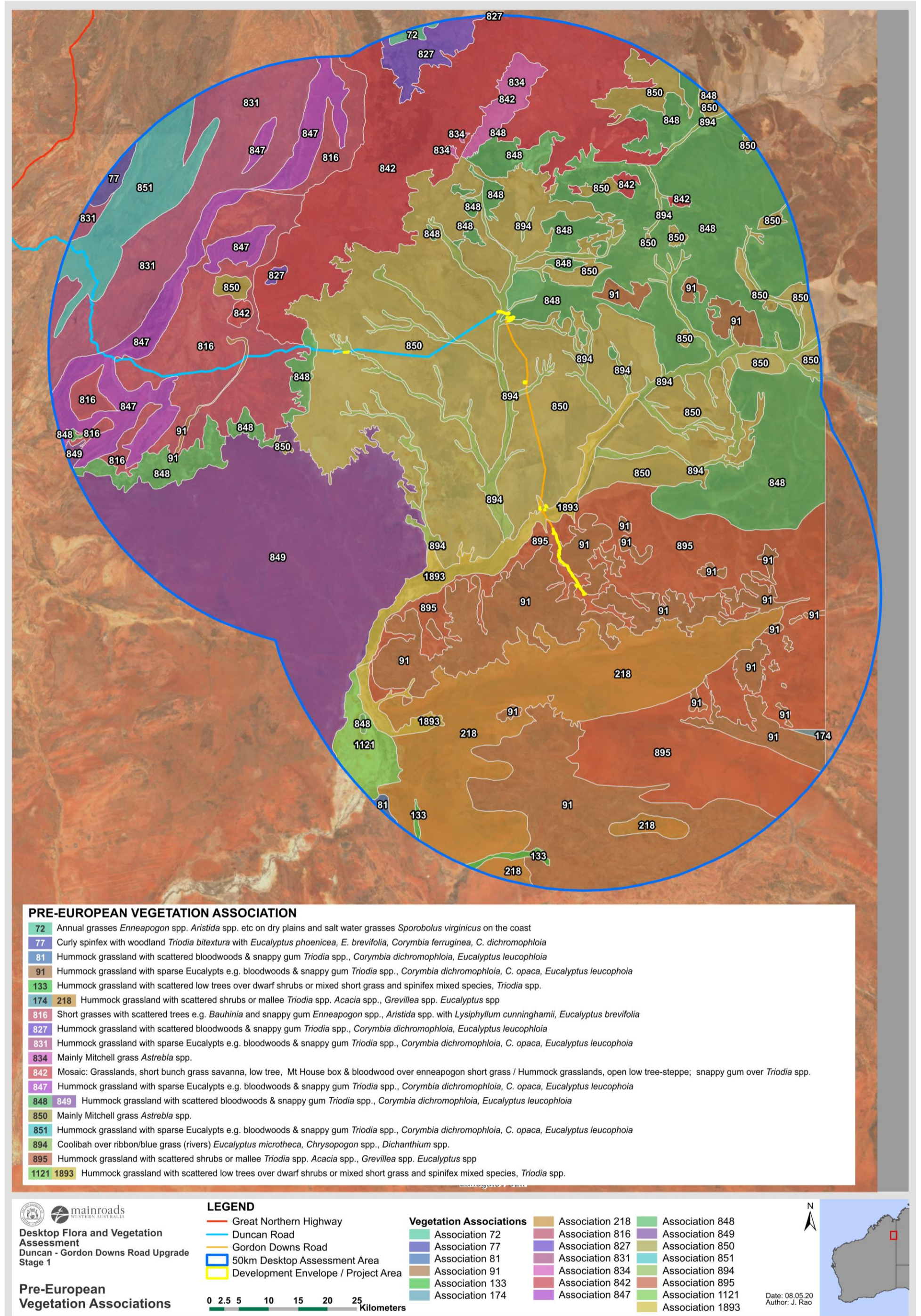


Figure 3. Pre-European Vegetation Associations

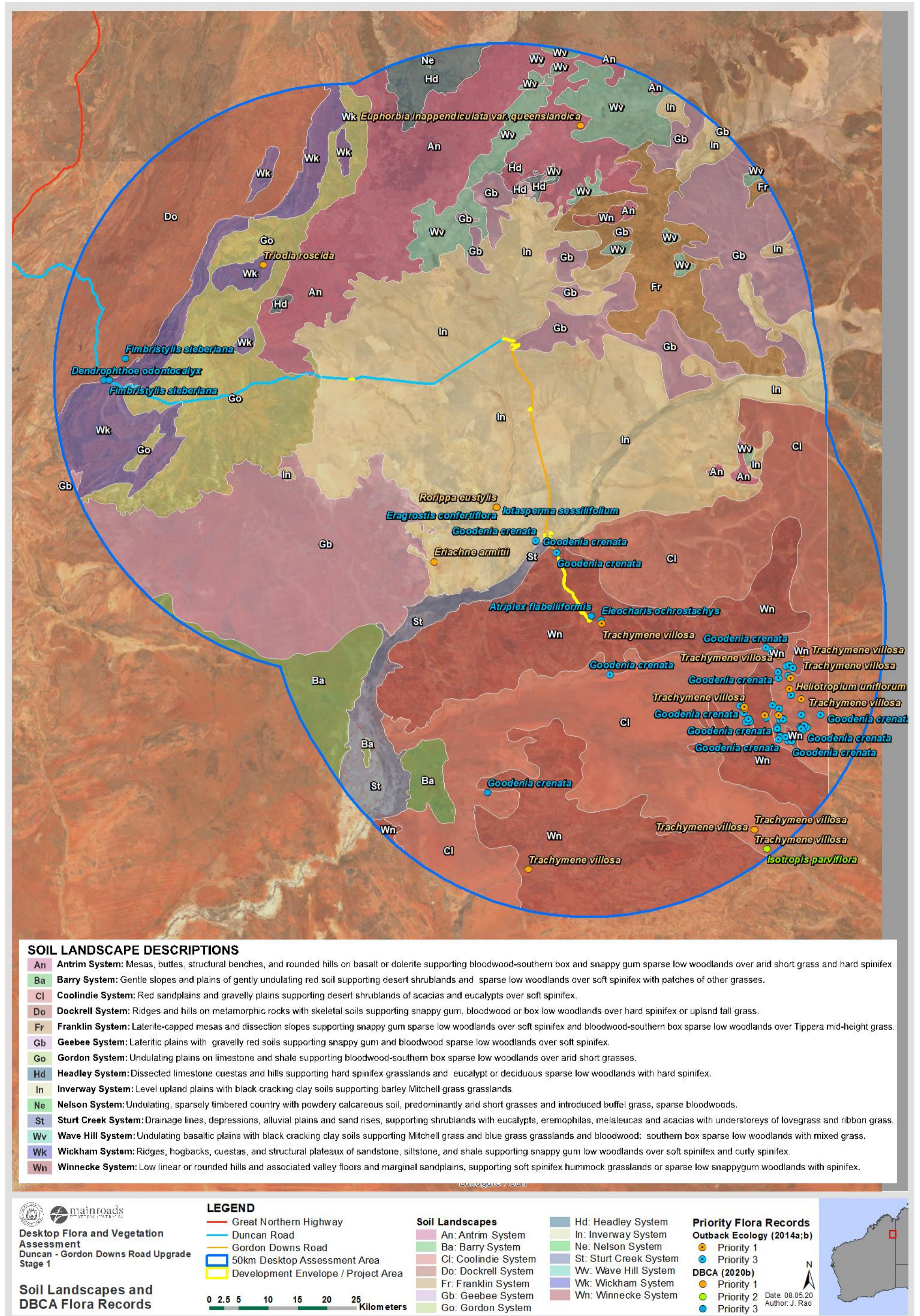


Figure 4. Soil Landscapes and Historical Flora Records

5 VEGETATION TYPES

Eight vegetation types were mapped throughout the Development Envelope, based on the results of a site visit, extrapolating mapping by Outback Ecology and Broad Vegetation Associations (Outback Ecology 2014b; Shepherd et al. 2002). These vegetation types are described in Table 5. Figure 5 illustrates the extent of these vegetation types within the Development Envelope.

Table 5 also provides an estimate of the extent of these vegetation types within the 50km Desktop Assessment Area. It is worth noting that because the entire Desktop Assessment Area was not mapped for vegetation types, land system characterisation work by Schoknecht and Payne (2011) was used to inform these regional habitat estimates. This estimate was compiled by calculating the approximate extent of the closest landform types in the three Land Systems to the identified vegetation types (landform types within each Land System is provided in the Appendix 3 extract). This estimate is considered suitable for use in regional scale impact assessments.

Table 5. Vegetation Types within the Development Envelope

Vegetation Type	Associated Land System / Association	Extent in Dev. Envelope	Extent ¹ in 50km Desktop Area
Grassland			
V01 – Tussock Grassland * <i>Vachellia farnesiana</i> sparse to isolated shrubs over <i>Chrysopogon</i> dominated grasslands and isolated herbs	Inverway / 850 (Unit 1: 90%)	27 ha	273,431 ha
V02 – Hummock Grassland <i>Eucalyptus brevifolia</i> and <i>Acacia coleii</i> very sparse woodland over <i>Triodia</i> sp. open hummock grassland.	Gordon / 842	0.3 ha	597 ha ²
Shrubland			
V03 – Acacia Shrubland over Hummock Grasses <i>Eucalyptus ?brevifolia</i> low sparse woodland over <i>Acacia lysiphloia</i> and <i>A. elachantha</i> tall open shrubland over mixed sparse herbs and <i>Triodia pungens</i> open hummock grassland.	Geebee / 848	32.3 ha	168,478 ha
V04 – Chenopod Shrubland Sparse <i>Tecticornia</i> sp. shrubland and tussock grasses.	Winnecke / 895	5.3 ha	6,041 ha
Open Woodland			
V05 – Open Woodland over Tussock Grassland <i>Corymbia pachycarpa</i> sparse open woodland over <i>Acacia coleii</i> and tussock grasses and herbs.	Winnecke / 895	52.9 ha	70,478 ha
V06 – Open Woodland on Sandstone Outcrop <i>Corymbia ?dichromophloia</i> , <i>Eucalyptus brevifolia</i> , <i>Corymbia ?opaca</i> sparse open woodland over <i>Grevillea wickhamii</i> and <i>Acacia hilliana</i> over <i>Triodia ?pungens</i> , assorted herbs and tussock grasses	Winnecke / 91	2 ha	130,887 ha
V07 – Open Woodland over Hummock Grassland <i>Eucalyptus ?brevifolia</i> , <i>Corymbia ?opaca</i> and <i>Eucalyptus</i> sp. open woodland over <i>Grevillea wickhamii</i> , <i>Acacia lysiphloia</i> , <i>Acacia coleii</i> over <i>Triodia ?pungens</i> and assorted herbs.	Winnecke / 91	67.5 ha	130,290 ha ²

Vegetation Type	Associated Land System / Association	Extent in Dev. Envelope	Extent ¹ in 50km Desktop Area
Riparian Vegetation			
V08 – Eucalypt Woodland (riverine) <i>Corymbia ?opaca</i> and <i>Terminalia</i> sp. open woodland over * <i>Vachellia farnesiana</i> scattered shrubs over <i>Chrysopogon fallax</i> open tussock grassland	Inverway & Winnecke / 894 (Unit 3: 5%)	2 ha	15,191 ha
Cleared Areas		40.4 ha	N/A
TOTAL		189.3 ha	

¹ Estimated extent based on closest matching landform types within the associated land system (Schoknecht and Payne 2011; Appendix 4). Note that similar habitats may exist in other land systems.

² V02 unit is too small to be mapped in Land System or Pre-European Associations. Therefore, an estimate was obtained using the estimate developed for the Rocky Plains Habitat (consisting of V02 and V07) in the Duncan-Gordon Downs Road Desktop Fauna Assessment (MRWA 2020). The proportion of V02 in relation to V07 mapped in this assessment was applied to the regional extent of the Rocky Plains Habitat. The resulting area is suitably small and roughly reflects the uncommon nature of the V02 vegetation type.

5.1 Mapped Vegetation Types

5.1.1 V01 –Tussock Grassland



Plate 1. V01 – Tussock Grassland

Almost treeless plains of self-mulching cracking clays (black soil) with occasional clusters of **Vachellia farnesiana* and **Calotropis procera*, usually in disturbed or heavily grazed areas. Typical understorey species includes a variety of grasses, *Chrysopogon* and *Astrebla* sp., with some herbs such as *Gossypium ?australe*, *Cucumis ?melo*.

Area is extensively used for pastoral activity. At the time of the site assessment, most areas were relatively dry, however, this area can become severely waterlogged during periods of heavy rain. This vegetation type is closely aligned with the Inverway System and Association 850. No other Land Systems was found to contain this habitat type.

5.1.2 V02 – Hummock Grassland



Plate 2. V02 – Hummock Grassland

Generally comprised of very sparse overstorey of *Eucalyptus brevifolia* over scattered *Acacia* midstorey (typically *Acacia coleii*) over an understorey dominated by spinifex (*Triodea spp.*). Substrate is generally a mixture of sandstone and quartzite.

This vegetation type was found in isolated 'pockets' within the Inverway Land System, which mainly consists of dark cracking clays. These pockets were nearly always found at the margins of other Land Systems, or adjacent to drainage lines. This indicates that the cracking clay soils of the Inverway system overlies other land systems.

5.1.3 V03 – Acacia Shrubland over Hummock Grasses



Plate 3. V03 – Acacia Shrubland over Hummock Grasses

Closely associated with the Geebee System (Unit 1 – upper crests and slopes), this vegetation type consists of very sparse Eucalypt overstorey, dense acacia dominated midstorey (mainly *Acacia coleii* and *A. wickhamii*) over understorey of spinifex (*Triodia* sp.). Substrate in this vegetation type consists of sand with a significant fraction of lateritic gravels.

5.1.4 V04 – Chenopod Shrubland



Plate 4. V04 – Chenopod Shrubland

This vegetation type typically occupies a small portion of low-lying areas within valleys of the Winnecke Land System, typically adjacent to the V06 vegetation type (Units 2 and 3 – gently sloping sandplains or valley floors). Approximately 9% of the landforms associated with Units 2 and 3 was this vegetation type. Generally minimally vegetated, dominated by tussock grasses and samphires (*Tecticornia* spp). A lack of vegetation may be due to over-grazing.

5.1.5 V05 – Open Woodland over Tussock Grasses



Plate 5. V05 – Open Woodland over Tussock Grasses

This vegetation type was relatively widespread through the Development Envelope, and is generally associated with the Winnecke System (Units 2 and 3 – gently sloping valley floors and gently sloping sandplain). Overstorey is sparse (generally eucalypts), over scattered acacia midstorey (mainly *Acacia colei*), over an understorey of mixed tussock and hummock grasses. Most areas generally showed red or yellow-red sands.

A small portion of the Inverway System was found to contain similar vegetation (V04; SLK 35.54 Material Area). This area is just north of Sturt Creek, which sits along the border of the Inverway and Winnecke System. It is likely that SLK 35.54 Material area is an inclusion/pocket of the Winnecke System, which could extend under the Sturt Creek System and into the Inverway System.

5.1.6 V06 – Open Woodland on Sandstone Outcrops



Plate 6. V06 – Open Woodland on Sandstone Outcrops

This vegetation type is closely aligned with the Winnecke Land System Unit 1 (low linear or rounded hills) and is generally found at upper elevations of the System. There is sparse Eucalypt overstorey cover, with scattered Acacia midstorey (mostly *Acacia colei* and some *A. wickhamii*), over understorey of spinifex (*Triodia* sp.)

Substrate in this vegetation type consists almost entirely of sandstone/quartzite rock outcrops with skeletal soils.

5.1.7 V07 – Open Woodland on Hummock Grassland



Plate 7. V07 – Open Woodland on Hummock Grassland

Widespread within the Winnecke System, generally on the slopes or low hills. Overstorey is very sparse, consisting of *Eucalyptus/Corymbia* spp. (with some *Cassytha filiformis* vines). Midstorey consists of *Grevillea wickhamii*, *Acacia lysiphloia* over understorey of *Triodia* sp, with herbs such as *Indigofera* sp., *Petalostylis cassioides*, *Senna notabilis* and *Tephrosia* sp.

Substrate is generally sandstone or lateritic gravels. No quartzite was noted in these areas (it is likely that quartzite becomes more apparent in uplifted areas of the Winnecke Land System, where it pushes through a sandstone upper layer).

5.1.8 V08 – Eucalypt Woodland (riverine)



Plate 8. V08 – Eucalypt (riverine) woodland

This habitat type was found in a variety of Land Systems, but is most evident in the Inverway System (Unit 3 – Linear tracts with intense braided pattern of small channels). These ephemeral drainage lines are clearly defined and relatively narrow, lined with eucalypts and some shrubs (mainly **Vachelia farnesiana*). Substrate in this habitat typically consists of muddy, clayey sands.

This habitat type is generally distinct from 'riparian habitat' which consists of seasonally inundated marshlands, as opposed to clearly defined drainage lines. Disturbance from cattle (and possibly introduced fauna) was evident in all areas.

5.2 Priority Ecological Communities

Vegetation Association 850 as defined by Beard's (1979) mapping of the Kimberley is listed as a Priority 3 Priority Ecological Community (PEC; DBCA 2020d). This PEC is described as grasslands, tall bunch grass savanna, Mitchell and blue grass. It is possible that the V01 vegetation type is included in this PEC, however no detailed PEC descriptions are available from DBCA. There is 27 ha of V01 vegetation within the Development Envelope.

A review of the PEC listing did not show any similarity between other listed PECs and recorded vegetation types (DBCA 2020c).



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DEPARTMENT OF
TRANSPORT

Desktop Flora and Vegetation Assessment
Duncan - Gordon Downs Road Upgrade
Stage 1

Vegetation Types
Map A

LEGEND

- Development Envelope
- Plates
- 2020 GPS Track Log
- C: Cleared

Grassland

- V01: Tussock Grassland
- V02: Hummock Grassland

Shrubland

- V03: Acacia shrubland over Hummock Grasses
- V04: Chenopod Shrubland

Open Woodland

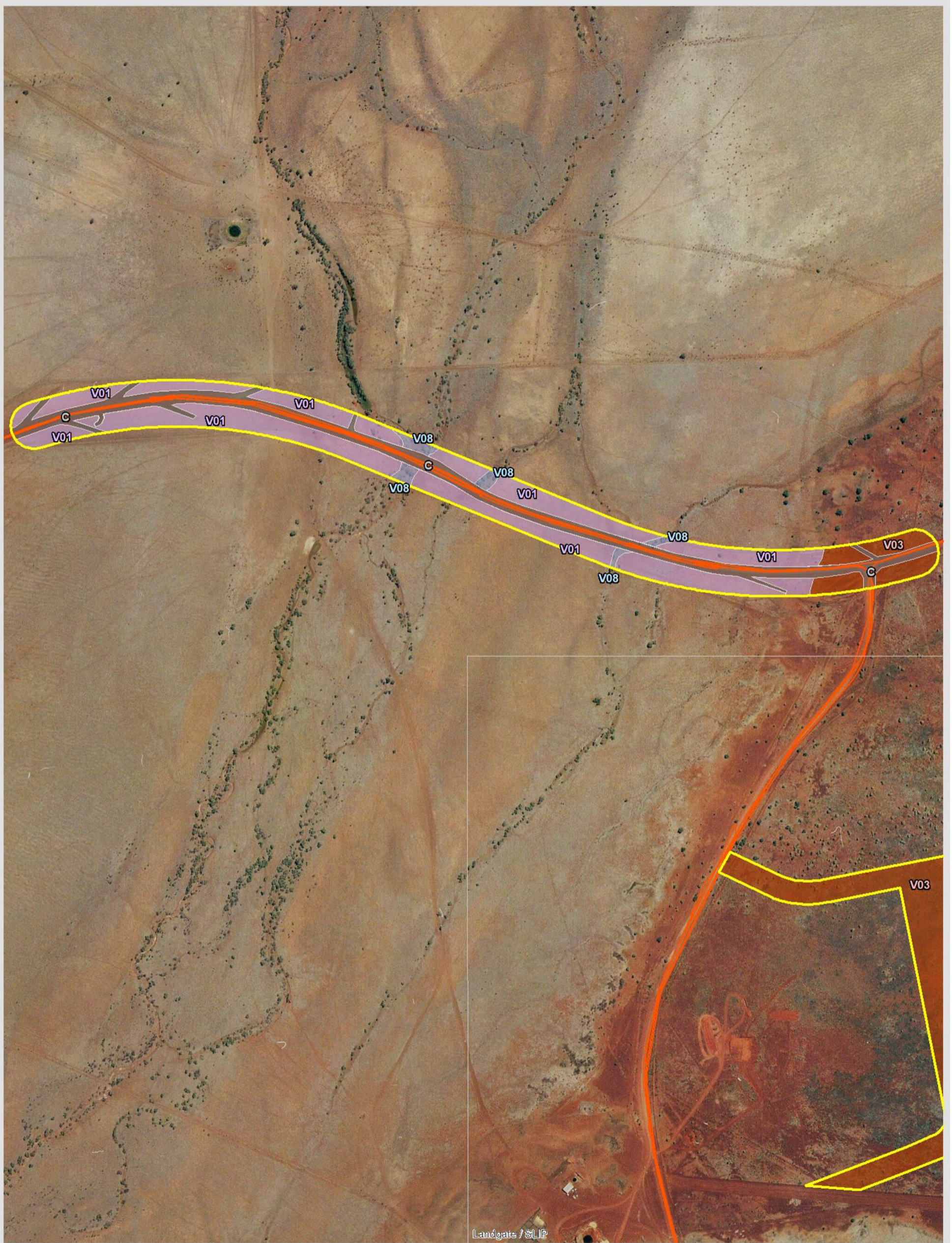
- V05: Open Woodland over Tussock Grasses
- V06: Open Woodland over Sandstone Outcrop
- V07: Open Woodland on Hummock Grassland

Riparian Vegetation

- V08: Eucalypt (riverine) Woodland

Date: 14.04.20
Author: J. Rao

Figure 5A. Vegetation Types in Development Envelope (MRWA 2020)



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DEPARTMENT OF INFRASTRUCTURE

Desktop Flora and Vegetation Assessment
Duncan - Gordon Downs Road Upgrade
Stage 1

Vegetation Types
Map B

LEGEND

- Development Envelope
- Plates
- 2020 GPS Track Log
- C: Cleared

Grassland

- V01: Tussock Grassland
- V02: Hummock Grassland

Shrubland

- V03: Acacia shrubland over Hummock Grasses
- V04: Chenopod Shrubland

Open Woodland

- V05: Open Woodland over Tussock Grasses
- V06: Open Woodland over Sandstone Outcrop
- V07: Open Woodland over Hummock Grasses

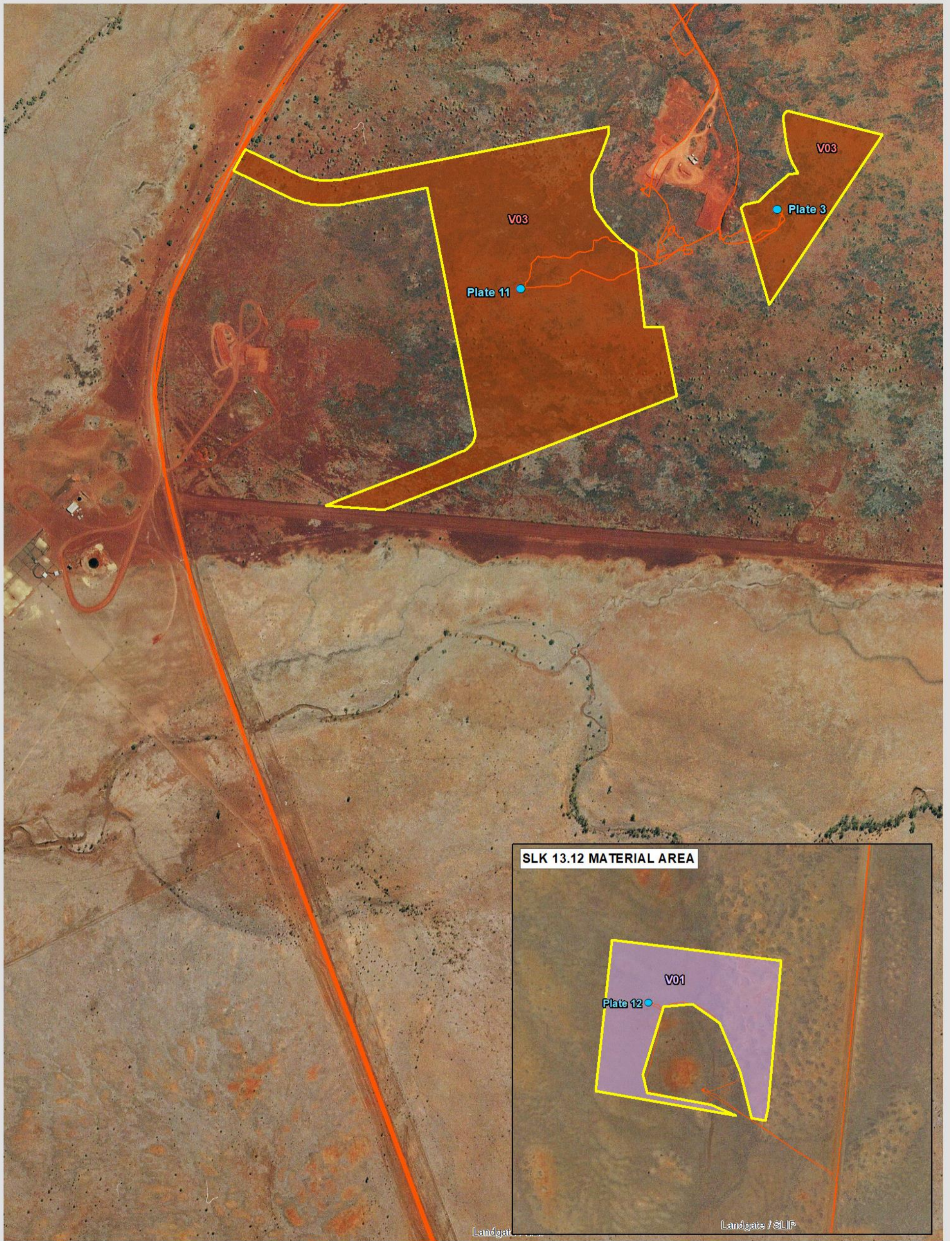
Riparian Vegetation

- V08: Eucalypt (riverine) Woodland

Date: 14.04.20
Author: J. Rao

0 25 50 100 150 200 Meters

Figure 5B. Vegetation Types in Development Envelope (MRWA 2020)



<p>Vegetation Types Map C</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Development Envelope ● Plates 2020 GPS Track Log C: Cleared <p>Grassland</p> <ul style="list-style-type: none"> V01: Tussock Grassland V02: Hummock Grassland 	<p>Shrubland</p> <ul style="list-style-type: none"> V03: Acacia shrubland over Hummock Grasses V04: Chenopod Shrubland 	<p>Open Woodland</p> <ul style="list-style-type: none"> V05: Open Woodland over Tussock Grasses V06: Open Woodland over Sandstone Outcrop V07: Open Woodland over Hummock Grasses 	<p>Riparian Vegetation</p> <ul style="list-style-type: none"> V08: Eucalypt (riverine) Woodland 	<p>Date: 14.04.20 Author: J. Rao</p> <p>0 25 50 100 150 200 Meters</p>
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Figure 5C. Vegetation Types in Development Envelope (MRWA 2020)

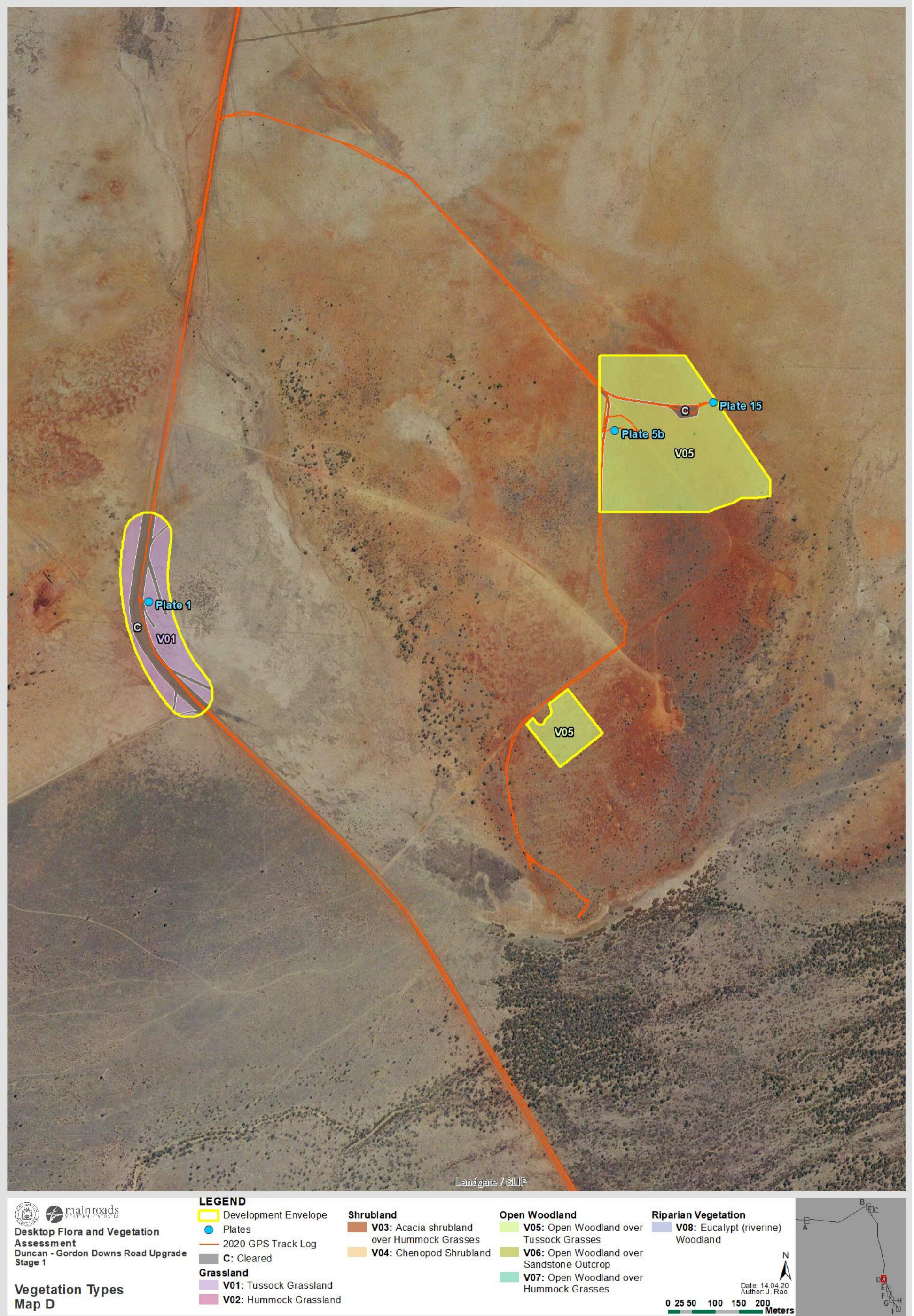


Figure 5D. Vegetation Types in Development Envelope (MRWA 2020)



mainroads
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Stage 1

Vegetation Types
Map E

LEGEND

 Development Envelope	Shrubland	 V05: Open Woodland over Tussock Grasses	 V08: Eucalypt (riverine) Woodland
● Plates	 V03: Acacia shrubland over Hummock Grasses	 V06: Open Woodland over Sandstone Outcrop	
 2020 GPS Track Log	 V04: Chenopod Shrubland	 V07: Open Woodland over Hummock Grasses	
 C: Cleared			
Grassland			
 V01: Tussock Grassland			
 V02: Hummock Grassland			

Date: 14.04.20
Author: J. Rao

0 25 50 100 150 200 Meters

Figure 5E. Vegetation Types in Development Envelope (MRWA 2020)



mainroads
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 Assessment
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**Vegetation Types
 Map F**

LEGEND

- Development Envelope
- Plates
- 2020 GPS Track Log
- C: Cleared
- Grassland**
- V01: Tussock Grassland
- V02: Hummock Grassland

Shrubland

- V03: Acacia shrubland over Hummock Grasses
- V04: Chenopod Shrubland

Open Woodland

- V05: Open Woodland over Tussock Grasses
- V06: Open Woodland over Sandstone Outcrop
- V07: Open Woodland over Hummock Grasses

Riparian Vegetation

- V08: Eucalypt (riverine) Woodland

Date: 14.04.20
 Author: J. Rao
 0 25 50 100 150 200 Meters

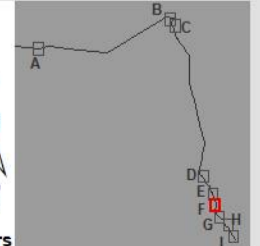


Figure 5F. Vegetation Types in Development Envelope (MRWA 2020)



Landgate / SLIP



Desktop Flora and Vegetation Assessment
Duncan - Gordon Downs Road Upgrade
Stage 1

Vegetation Types
Map G

LEGEND

- Development Envelope
- Plates
- 2020 GPS Track Log
- C: Cleared
- Grassland**
- V01: Tussock Grassland
- V02: Hummock Grassland

Shrubland

- V03: Acacia shrubland over Hummock Grasses
- V04: Chenopod Shrubland

Open Woodland

- V05: Open Woodland over Tussock Grasses
- V06: Open Woodland over Sandstone Outcrop
- V07: Open Woodland over Hummock Grasses

Riparian Vegetation

- V08: Eucalypt (riverine) Woodland

0 25 50 100 150 200 Meters

Date: 14.04.20
Author: J. Rao

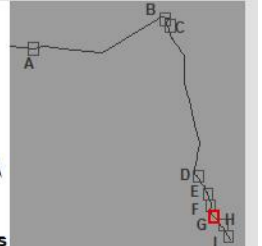
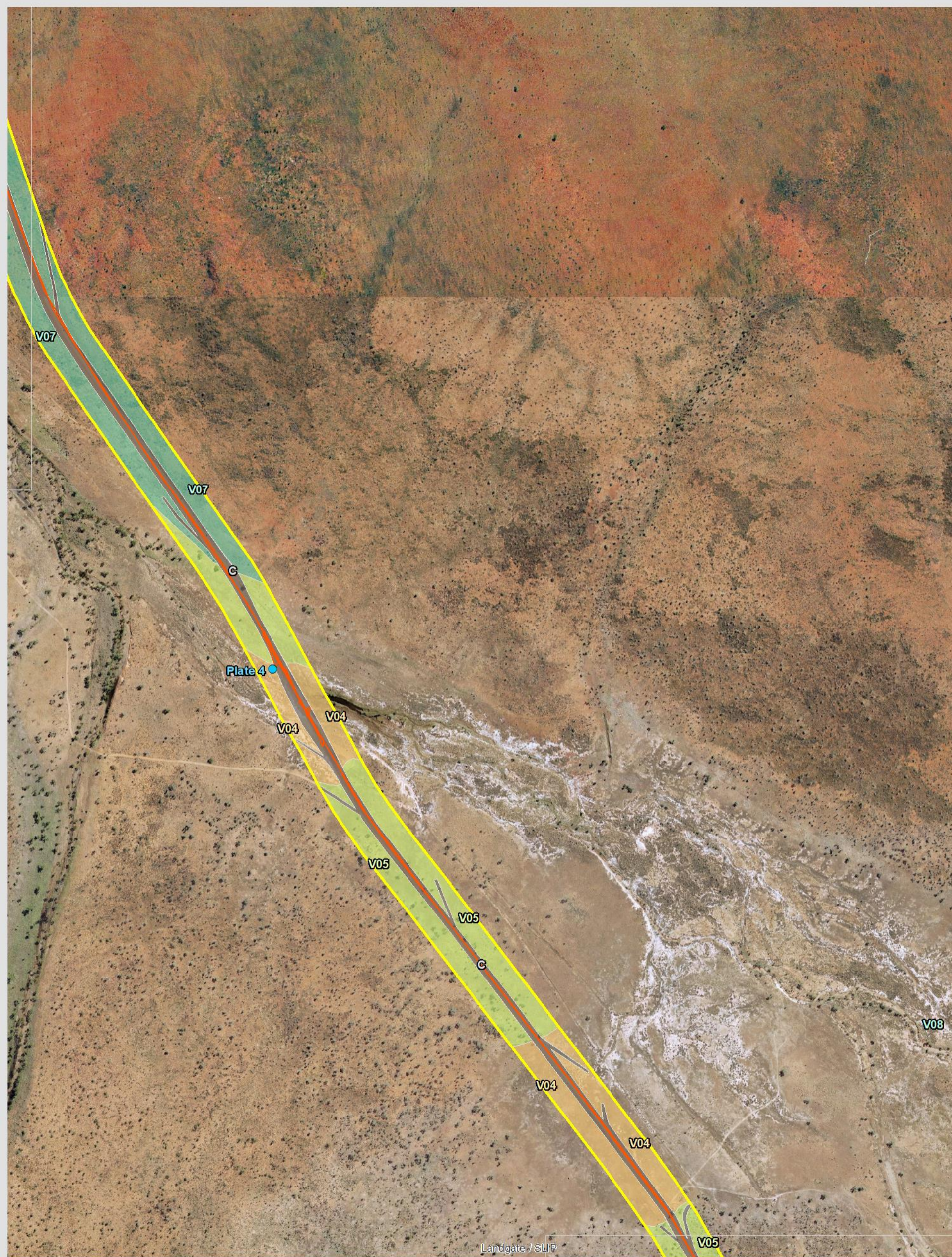
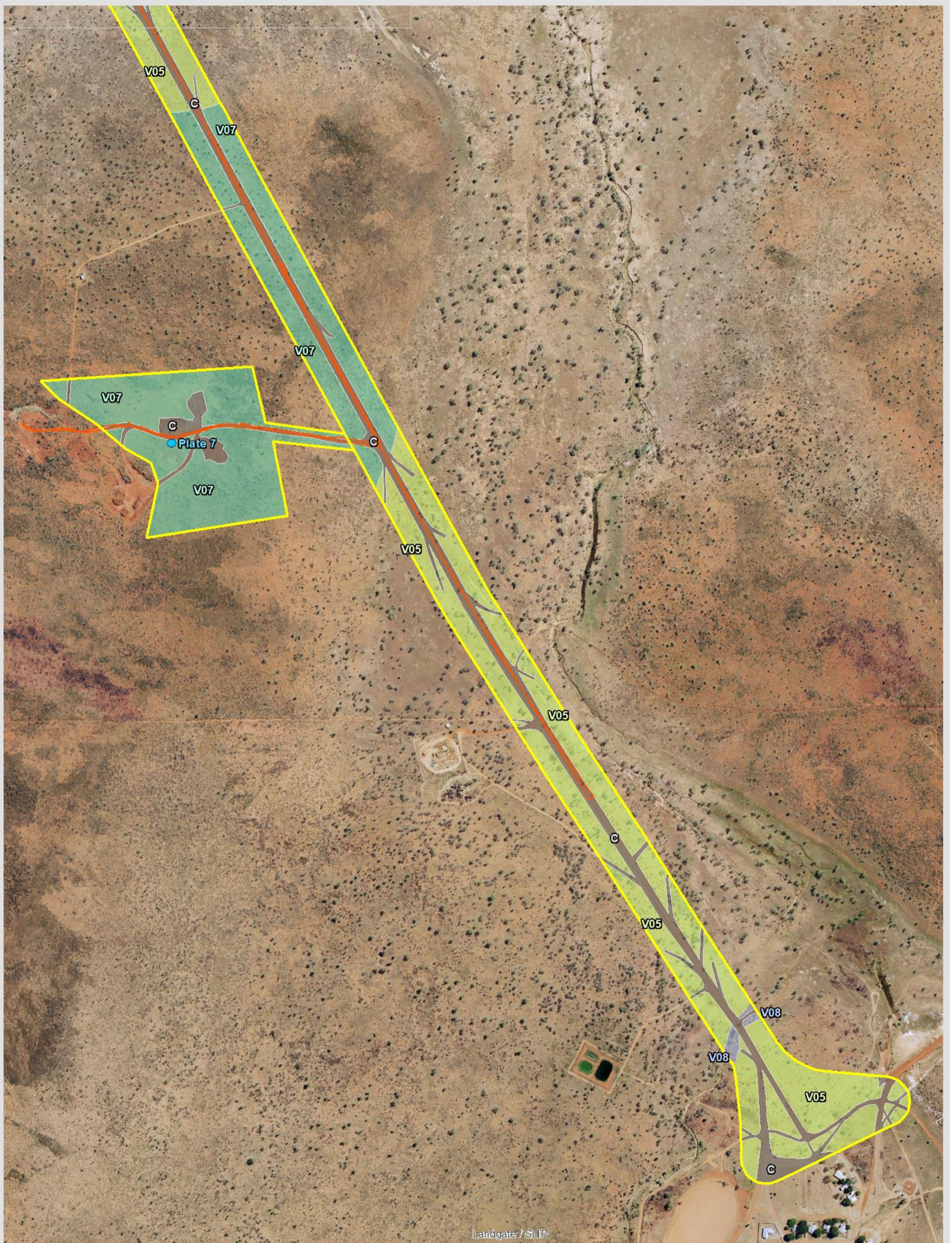


Figure 5G. Vegetation Types in Development Envelope (MRWA 2020)



<p>Vegetation Types Map H</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Development Envelope ● Plates 2020 GPS Track Log C: Cleared <p>Grassland</p> <ul style="list-style-type: none"> V01: Tussock Grassland V02: Hummock Grassland 	<p>Shrubland</p> <ul style="list-style-type: none"> V03: Acacia shrubland over Hummock Grasses V04: Chenopod Shrubland 	<p>Open Woodland</p> <ul style="list-style-type: none"> V05: Open Woodland over Tussock Grasses V06: Open Woodland over Sandstone Outcrop V07: Open Woodland over Hummock Grasses 	<p>Riparian Vegetation</p> <ul style="list-style-type: none"> V09: Eucalypt (riverine) Woodland 	<p>Date: 14.04.20 Author: J. Rao</p> <p>0 25 50 100 150 200 Meters</p>
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Figure 5H. Vegetation Types in Development Envelope (MRWA 2020)



Landgate / SLIP



Desktop Flora and Vegetation Assessment
 Duncan - Gordon Downs Road Upgrade
 Stage 1

Vegetation Types Map 1

LEGEND

- Development Envelope
- Plates
- 2020 GPS Track Log
- C: Cleared
- Grassland**
- V01: Tussock Grassland
- V02: Hummock Grassland

Shrubland

- V03: Acacia shrubland over Hummock Grasses
- V04: Chenopod Shrubland

Open Woodland

- V05: Open Woodland over Tussock Grasses
- V06: Open Woodland over Sandstone Outcrop
- V07: Open Woodland over Hummock Grasses

Riparian Vegetation

- V08: Eucalypt (riverine) Woodland

0 25 50 100 150 200 Meters

Date: 14.04.20
 Author: J. Rao

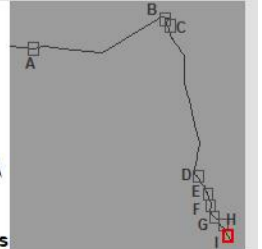


Figure 5I. Vegetation Types in Development Envelope (MRWA 2020)

6 FLORA AND VEGETATION RECORDS

6.1 Database Search Results

A search of DBCA databases (Threatened and Priority Flora, WA Herbarium Database at a 50km buffer, NatureMap at 40km buffer, the Priority Ecological Community List and Ecological Communities database) and DAWE databases (Protected Matters Search Tool at a 50km buffer) identified the following significant species and communities listed by DBCA:

Priority 1

- *Eriachne armitii*;
- *Euphorbia inappendiculata* var. *queenslandica*;
- *Rorippa eustylis*;
- *Trachymene villosa*; and
- *Triodia roscida*.

Priority 2

- *Isotropis parviflora*.

Priority 3

- *Atriplex flabelliformis*;
- *Dendrophthoe odontocalyx*;
- *Eragrostis confertiflora*;
- *Fimbristylis sieberiana*;
- *Goodenia crenata*; and
- *Iotasperma sessilifolium*.

Priority Ecological Communities

- Gordon Land System (Priority 3);
- Kimberley Vegetation Association 834 (Priority 3);
- Vegetation Association 850 (Priority 3); and
- Nelson Land System (Priority 3).

No Threatened species or Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act 2016* or the *Environmental Protection and Biodiversity Act 1999* occur within the Development Envelope or surrounding Desktop Assessment Area.

6.2 Site Assessment Results

Previous field surveys conducted by Outback Ecology (2014b) confirmed the presence of *Goodenia crenata* (P3) within 500m of the Development Envelope, and in similar habitat (Figure 4). No targeted searches for significant flora were carried out during the 2020 site assessment.

6.3 Introduced species

The site assessment noted three species of weeds, of which **Calotropis procera* is a Declared Plant:

- **Stylosanthes hamata*
- **Vachellia farnesiana* (Mimosa bush / Prickly acacia); and
- **Calotropis procera*



Plate 9. *Vachellia farnesiana* (Prickly Acacia) was common on disturbed roadsides and areas of heavy grazing.

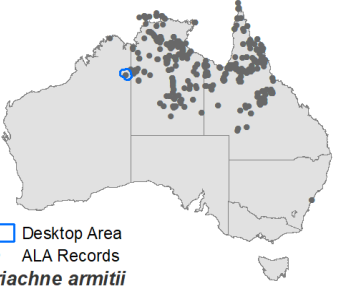
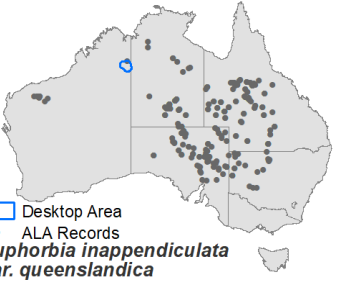
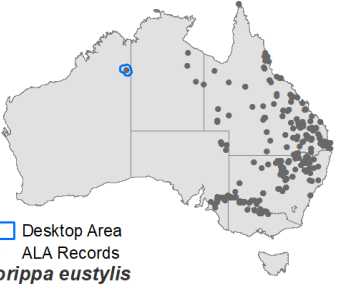
7 LIKELIHOOD OF OCCURENCE



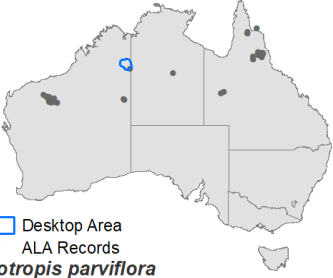
Table 6 presents a likelihood of occurrence for all significant flora species identified in the desktop searches

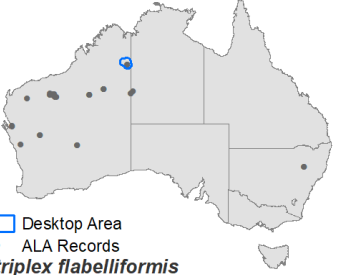
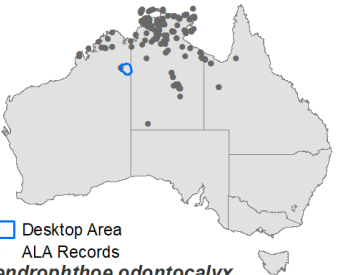
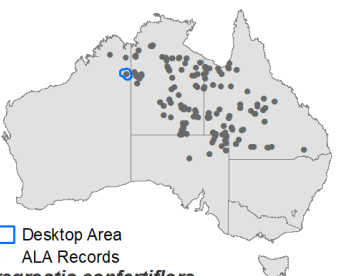
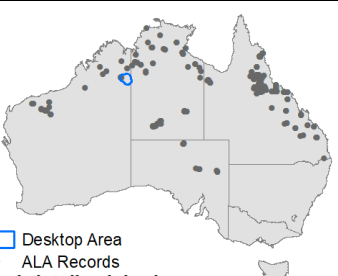
Likelihood of occurrence was based on several factors such as known habitat preferences for the species, and whether or not the species had been detected within similar vegetation types to those present in the Development Envelope, either during the site assessment or in previous surveys. Distribution mapping used spatially validated records from the ALA, which includes records from the Western Australian Museum. In general:


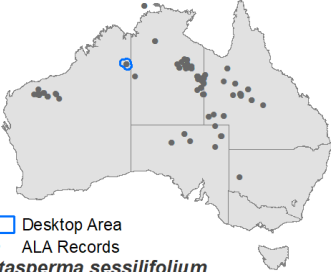
- **Unlikely to Occur:** No suitable habitat within Development Area;
- **May Occur:** Some suitable habitat, but no known records within 50km of Development Envelope, or species occurs in low densities across large areas;
- **Likely to Occur:** Suitable habitat exists in Development Envelope, and species is known to occur in nearby areas (within 50km).
- **Confirmed to Occur:** Identified within the Development Envelope during field assessments.

Table 6. Likelihood of Occurrence

Species	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
PRIORITY 1				
<i>Eriachne armitii</i>	Recorded in the Inverway system / Association 894	 <p>Desktop Area • ALA Records <i>Eriachne armitii</i></p>	Likely to Occur in Development Envelope	<p>Habitat Preference Lateritic soils, Plains (Western Australian Herbarium 1998-).</p> <p>Habitat Availability in Development Envelope The Development envelope is at the western most extent of the range of the species and it occurs throughout northern Australia across the Northern Territory and Queensland. It is possible that the species is more widespread in Western Australia and a lack of records is due to a lack of survey effort in the eastern Kimberly.</p> <p>The V03 and potentially V05 vegetation types may contain suitable habitat (85.2 ha in total). Historical records indicate the species was found within the Inverway system, likely within an inclusion of another Land System based on aerial imagery (Figure 4).</p>
<i>Euphorbia inappendiculata</i> var. <i>queenslandica</i>	Recorded in the Antrim System / Association 842	 <p>Desktop Area • ALA Records <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i></p>	Likely to Occur in Development Envelope	<p>Habitat Preference Heavy soils, cracking clays, floodplains (Outback Ecology 2014b).</p> <p>Habitat Availability in Development Envelope The V01 vegetation type appears to be most suitable as habitat for this species and is considered likely to occur based on historic records found within 50km (27 ha in Development Envelope). The species is widespread across eastern Australia, but relatively uncommon in northern Western Australia, likely due to sampling bias.</p>
<i>Rorippa eustylis</i>	Recorded in the Inverway system / Association 894	 <p>Desktop Area • ALA Records <i>Rorippa eustylis</i></p>	May Occur in Development Envelope	<p>Habitat Preference Around pools or along watercourses (Western Australian Herbarium 1998-).</p> <p>Habitat Availability in Development Envelope Based on habitat requirements, this species may occur in the V08 vegetation types (2 ha in total). The species predominately occurs in Queensland and New South Wales and it is likely to require swampy areas. All watercourses within the Development Envelope are ephemeral so it is considered unlikely to occur in most areas of this vegetation type.</p>

Species	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
<i>Trachymene villosa</i>	Recorded in the Winnecke and Coolindie system / Association 218 and 895	 <p>Desktop Area ALA Records <i>Trachymene villosa</i></p>	May Occur in Development Envelope	<p>Habitat Preference Skeletal soils over quartzite (Western Australian Herbarium 1998-)</p> <p>Habitat Availability in Development Envelope Quartzite was noted within the V02 and V06 vegetation type (2.3 ha in total) . Other vegetation types with rocky or gravelly soils was almost exclusively lateritic or sandstone gravels. The species is more widespread further east in the Northern Territory, but given it is an annual, detection is likely dependent upon survey timing post rain. Additionally, grazing by native and feral animals may mean it is difficult to detect.</p>
<i>Triodia roscida</i>	Recorded in the Wickham system / Association 847	 <p>Desktop Area ALA Records <i>Triodia roscida</i></p>	May Occur in Development Envelope	<p>Habitat Preference Stony alluvium. Rocky slopes of ranges, creeks (Western Australian Herbarium 1998-).</p> <p>Habitat Availability in Development Envelope Based on habitat requirements, it is possible that the species may be found in the V02, V07 and V08 vegetation types (69.8 ha in total). These vegetation types are similar to those found in the Wickham System where historical records of the species were found.</p>
PRIORITY 2				
<i>Isotropis parviflora</i>	Recorded in the Coolindie system / Association 91	 <p>Desktop Area ALA Records <i>Isotropis parviflora</i></p>	Unlikely to Occur in Development Envelope	<p>Habitat Requirements Valley slope of ironstone plateau (Western Australian Herbarium 1998-).</p> <p>Habitat in Development Envelope There is no suitable habitat for this species in the Development Envelope. Historic records of this species are from the far south of the Desktop Assessment Area, approaching 50km in distance (DBCA 2020b).</p>
PRIORITY 3				

Species	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
<i>Atriplex flabelliformis</i>	Recorded in the Winnecke system / Association 91	 <p>Desktop Area • ALA Records <i>Atriplex flabelliformis</i></p>	Likely to Occur in Development Envelope	<p>Habitat Requirements Saline flats or marshes (Western Australian Herbarium 1998-)</p> <p>Habitat in Development Envelope V04 is likely to be suitable for this species (5.3 ha in total). The closest historical record is listed as recorded 'on salty, lateritic flat', which is very similar to V04.</p>
<i>Dendrophthoe odontocalyx</i>	Recorded in the Dockrell system / Association 831	 <p>Desktop Area • ALA Records <i>Dendrophthoe odontocalyx</i></p>	Unlikely to Occur in Development Envelope	<p>Habitat Requirements Hemiparasitic; on melaleuca (Western Australian Herbarium 1998-).</p> <p>Habitat in Development Envelope No species of <i>Melaleuca</i> was identified within the Development Envelope. Therefore, it is unlikely that this species would occur.</p>
<i>Eragrostis confertiflora</i>	Recorded in the Inverway system / Association 894	 <p>Desktop Area • ALA Records <i>Eragrostis confertiflora</i></p>	Likely to Occur in Development Envelope	<p>Habitat Requirements Edges of waterholes (Western Australian Herbarium 1998-).</p> <p>Habitat in Development Envelope The V08 vegetation type appears to be most suitable (2.3 ha in total).</p>
<i>Fimbristylis sieberiana</i>	Recorded in the Dockrell and Wickham system / Association 831 and 847	 <p>Desktop Area • ALA Records <i>Fimbristylis sieberiana</i></p>	May Occur in Development Envelope	<p>Habitat Requirements Mud, skeletal soil pockets. Pool edges, sandstone cliffs (Western Australian Herbarium 1998-).</p> <p>Habitat in Development Envelope Certain areas of the V08 and V06 vegetation types may be suitable for this species (4 ha in total). However the species is widespread across northern Australia and the Development Envelope represents a small portion of the known range.</p>

Species	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
<i>Goodenia crenata</i>	Recorded in the Coolindie system / Association 218	 <p>Desktop Area ALA Records <i>Goodenia crenata</i></p>	Likely to Occur in Development Envelope	<p>Habitat Requirements Fine red earth, red clay, flat sandplains, sandstone outcrops (Western Australian Herbarium 1998-)</p> <p>Habitat in Development Envelope The species was confirmed to occur within 500m of the Development Envelope. Suitable habitat could include V03, V05, V06 and V07 (154.7 ha in total). This species is thought to have a relatively wide habitat preference which is the probable cause of the relatively large number of detections in previous surveys (Outback Ecology 2014a; 2014b).</p>
<i>Iotasperma sessilifolium</i>	Recorded in the Inverway system / Association 894	 <p>Desktop Area ALA Records <i>Iotasperma sessilifolium</i></p>	Likely to Occur in Development Envelope	<p>Habitat Requirements Edges of waterholes, plains (Western Australian Herbarium 1998-)</p> <p>Habitat in Development Envelope Habitat descriptions for this species is broad. The historical record located within 50km was noted as growing “in cracking clay edge of waterhole, black soil plain surrounds” (State Herbarium of South Australia; recorded 1973). Other records indicate the species has been previously found on gilgai, pebbly red loam and cracking clays, all at lower elevations (ALA 2020). Therefore, certain areas of V01, V05 and V08 may be suitable (81.9 ha in total). The broad habitat preference of this species indicates widespread availability of habitat and a lack of records is most likely due to a lack of survey effort and/or rainfall availability.</p>

8 CONCLUSION

The desktop flora and vegetation assessment characterised and mapped the vegetation types present within the DGDRU Development Envelope based on desktop information, database searches and observations from a site visit carried out in April 2020. Eight vegetation types were mapped within the Development Envelope. Estimates of the regional extents of these vegetation types were calculated by extrapolating to a 50km radius based on Land System or Pre-European Vegetation Association mapping by the Department of Agriculture and Food (DPIRD 2019a; DPIRD 2019b).

All vegetation types recorded were found to be common within the 50km Desktop Assessment Area, with the exception of the V02 (Hummock grassland; thought to be an inclusion from nearby land systems which occurs near drainage lines). Estimated extent for the V02 vegetation type is 597 ha within a 50km radius of the Development Envelope.

A review of desktop information sources for Threatened and Priority flora and ecological communities was also conducted. No Threatened flora listed under the *Biodiversity Conservation Act 2016* or the *Environmental Protection and Biodiversity Conservation Act 1999* has been previously recorded in the region and none is likely to occur. Six priority flora are considered likely to occur based on habitat preferences. One Priority Ecological Community (PEC), Kimberley Vegetation Association 850 (Priority 3) was recorded in desktop searches and intersects the Development Envelope.

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10 APPENDICES

Appendix	Title
Appendix 1	DBCA NatureMap Search Results
Appendix 2	DoEE Protected Matters Search Tool Results
Appendix 3	Land System Descriptions (Schoknecht and Payne 2011)
Appendix 4	Other Site Photos (April 2020)

Appendix 1: DBCA NatureMap Search Results



NatureMap Flora Species Report 1

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 29' 28" E, 18° 21' 40" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	91	112
Priority 1	3	3
Priority 3	2	2
TOTAL	96	117

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandermie Grass)		P1	
2.	42861 <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i>		P1	
3.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
6.	4896 <i>Abutilon leucopetalum</i> (Desert Chinese Lantern)			
7.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
8.	3209 <i>Acacia ampliceps</i>			
9.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
10.	46578 <i>Acacia citriodora</i>			
11.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
12.	3326 <i>Acacia eriopoda</i> (Broome Pindan Wattle)			
13.	3430 <i>Acacia lysiphoia</i> (Turpentine Wattle)			
14.	3556 <i>Acacia stenophylla</i> (Belalie)			
15.	13070 <i>Acacia synchronica</i>			
16.	31076 <i>Amaranthus cochleitepalus</i>			
17.	43105 <i>Apowollastonia cylindrica</i>			
18.	12063 <i>Aristida holathera</i> var. <i>holathera</i>			
19.	215 <i>Aristida latifolia</i> (Feathertop Wiregrass)			
20.	221 <i>Aristida pruinosa</i> (Gulf Feathertop Wiregrass)			
21.	229 <i>Astrelba pectinata</i> (Barley Mitchell Grass)			
22.	230 <i>Astrelba squarrosa</i> (Bull Mitchell Grass)			
23.	4740 <i>Atalaya hemiglauc</i> (Whitewood)			
24.	5184 <i>Bergia pedicellaris</i>			
25.	2773 <i>Boerhavia paludosa</i>			
26.	750 <i>Bulbostylis barbata</i>			
27.	7369 <i>Citrullus colocynthis</i>	Y		
28.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
29.	18415 <i>Corchorus sidoides</i> subsp. <i>sidoides</i>			
30.	17092 <i>Corymbia opaca</i>			
31.	11903 <i>Crotalaria dissitiflora</i> subsp. <i>rugosa</i>			
32.	11993 <i>Crotalaria novae-hollandiae</i> subsp. <i>lasiophylla</i>			
33.	17117 <i>Cullen cinereum</i>			
34.	17434 <i>Cullen cuneatum</i>			
35.	17438 <i>Cullen plumosum</i>			
36.	17447 <i>Cullen pustulatum</i>			
37.	12811 <i>Cyperus cunninghamii</i> subsp. <i>cunninghamii</i>			
38.	7318 <i>Dentella minutissima</i>			
39.	3856 <i>Desmodium muelleri</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.

Department of Biodiversity,
Conservation and Attractions



Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	313 <i>Digitaria ctenantha</i> (Comb Finger Grass)			
41.	4777 <i>Dodonaea polyzyga</i>			
42.	328 <i>Echinochloa colona</i> (Awnless Barnyard Grass)	Y		
43.	7234 <i>Eremophila longifolia</i> (Berrigan, Tullypurpa)			
44.	16485 <i>Eriachne pulchella</i> subsp. <i>dominii</i>			
45.	5566 <i>Eucalyptus brevifolia</i> (Snappy Gum)			
46.	5590 <i>Eucalyptus chlorophylla</i>			
47.	15187 <i>Eucalyptus limitaris</i>			
48.	5724 <i>Eucalyptus odontocarpa</i> (Sturt Creek Mallee)			
49.	3884 <i>Flemingia pauciflora</i>			
50.	18372 <i>Gomphrena lanata</i>			
51.	7490 <i>Goodenia armitiana</i>			
52.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
53.	4910 <i>Gossypium australe</i> (Native Cotton)			
54.	1990 <i>Grevillea dimidiata</i> (Caustic Bush)			
55.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
56.	13440 <i>Grevillea wickhamii</i> subsp. <i>aprica</i>			
57.	2129 <i>Hakea arborescens</i> (Common Hakea)			
58.	6706 <i>Heliotropium cunninghamii</i>			
59.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
60.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
61.	458 <i>Iseilema dolichotrichum</i>			
62.	12059 <i>Jasminum didymum</i> subsp. <i>lineare</i> (Desert Jasmine)			
63.	11567 <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>			
64.	5051 <i>Melhaniea oblongifolia</i>			
65.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
66.	3615 <i>Neptunia gracilis</i> (Native Sensitive Plant)			
67.	3617 <i>Neptunia monosperma</i>			
68.	41221 <i>Pterocaulon serrulatum</i> var. <i>velutinum</i>			
69.	2704 <i>Ptilotus calostachyus</i> (Weeping Mulla Mulla)			
70.	2721 <i>Ptilotus exaltatus</i> (Tall Mulla Mulla)			
71.	2725 <i>Ptilotus fusiformis</i>			
72.	2761 <i>Ptilotus spicatus</i>			
73.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
74.	30434 <i>Salsola australis</i>			
75.	13176 <i>Scaevola laciniata</i>			
76.	16257 <i>Schoenoplectus subulatus</i>			
77.	12312 <i>Senna notabilis</i>			
78.	12319 <i>Senna venusta</i>			
79.	<i>Sesbania</i> sp.			
80.	15110 <i>Sida laevis</i>			
81.	7002 <i>Solanum diversiflorum</i>			
82.	28345 <i>Spermocoe dolichosperma</i>			
83.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
84.	8240 <i>Streptoglossa odora</i>			
85.	7729 <i>Stylidium fluminense</i>			
86.	4261 <i>Tephrosia brachycarpa</i>			
87.	33486 <i>Tephrosia lasiochlaena</i>			
88.	4280 <i>Tephrosia rosea</i> (Flinders River Poison, Bungoo'dah)			
89.	4281 <i>Tephrosia simplicifolia</i>			
90.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
91.	4283 <i>Tephrosia stipuligera</i>			
92.	4285 <i>Tephrosia supina</i>			
93.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
94.	47242 <i>Trichodesma zeylanicum</i> var. <i>latiseipaleum</i>			
95.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
96.	5106 <i>Waltheria indica</i>			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.





NatureMap Flora Species Report 2

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 29' 28" E, 18° 21' 40" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	91	112
Priority 1	3	3
Priority 3	2	2
TOTAL	96	117

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandeme Grass)		P1	
2.	42861 <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i>		P1	
3.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
6.	4896 <i>Abutilon leucopetalum</i> (Desert Chinese Lantern)			
7.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
8.	3209 <i>Acacia amplexes</i>			
9.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
10.	46578 <i>Acacia citriodora</i>			
11.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
12.	3326 <i>Acacia eriopoda</i> (Broome Pindan Wattle)			
13.	3430 <i>Acacia lysiphloia</i> (Turpentine Wattle)			
14.	3556 <i>Acacia stenophylla</i> (Belalie)			
15.	13070 <i>Acacia synchronicia</i>			
16.	31076 <i>Amaranthus cochleitepalus</i>			
17.	43105 <i>Apowollastonia cylindrica</i>			
18.	12063 <i>Aristida holathera</i> var. <i>holathera</i>			
19.	215 <i>Aristida latifolia</i> (Feathertop Wiregrass)			
20.	221 <i>Aristida pruinosa</i> (Gulf Feathertop Wiregrass)			
21.	229 <i>Astrebala pectinata</i> (Barley Mitchell Grass)			
22.	230 <i>Astrebala squarrosa</i> (Bull Mitchell Grass)			
23.	4740 <i>Atalaya hemiglauca</i> (Whitewood)			
24.	5184 <i>Bergia pedicellaris</i>			
25.	2773 <i>Boerhavia paludosa</i>			
26.	750 <i>Bulbostylis barbata</i>			
27.	7369 <i>Citrullus colocynthis</i>	Y		
28.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
29.	18415 <i>Corchorus sidoides</i> subsp. <i>sidoides</i>			
30.	17092 <i>Corymbia opaca</i>			
31.	11903 <i>Crotalaria dissitiflora</i> subsp. <i>rugosa</i>			
32.	11993 <i>Crotalaria novae-hollandiae</i> subsp. <i>lasiophylla</i>			
33.	17117 <i>Cullen cinereum</i>			
34.	17434 <i>Cullen cuneatum</i>			
35.	17438 <i>Cullen plumosum</i>			
36.	17447 <i>Cullen pustulatum</i>			
37.	12811 <i>Cyperus cunninghamii</i> subsp. <i>cunninghamii</i>			
38.	7318 <i>Dentella minutissima</i>			
39.	3856 <i>Desmodium muelleri</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	313 <i>Digitaria ctenantha</i> (Comb Finger Grass)			
41.	4777 <i>Dodonaea polyzyga</i>			
42.	328 <i>Echinochloa colona</i> (Awnless Barnyard Grass)	Y		
43.	7234 <i>Eremophila longifolia</i> (Berrigan, Tullypurpa)			
44.	16485 <i>Eriachne pulchella</i> subsp. <i>dominii</i>			
45.	5566 <i>Eucalyptus brevifolia</i> (Snappy Gum)			
46.	5590 <i>Eucalyptus chlorophylla</i>			
47.	15187 <i>Eucalyptus limitaris</i>			
48.	5724 <i>Eucalyptus odontocarpa</i> (Sturt Creek Mallee)			
49.	3884 <i>Flemingia pauciflora</i>			
50.	18372 <i>Gomphrena lanata</i>			
51.	7490 <i>Goodenia armitiana</i>			
52.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
53.	4910 <i>Gossypium australe</i> (Native Cotton)			
54.	1990 <i>Grevillea dimidiata</i> (Caustic Bush)			
55.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
56.	13440 <i>Grevillea wickhamii</i> subsp. <i>aprica</i>			
57.	2129 <i>Hakea arborescens</i> (Common Hakea)			
58.	6706 <i>Heliotropium cunninghamii</i>			
59.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
60.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
61.	458 <i>Iseilema dolichotrichum</i>			
62.	12059 <i>Jasminum didymum</i> subsp. <i>lineare</i> (Desert Jasmine)			
63.	11567 <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>			
64.	5051 <i>Melhanina oblongifolia</i>			
65.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
66.	3615 <i>Neptunia gracilis</i> (Native Sensitive Plant)			
67.	3617 <i>Neptunia monosperma</i>			
68.	41221 <i>Pterocaulon serrulatum</i> var. <i>velutinum</i>			
69.	2704 <i>Ptilotus calostachyus</i> (Weeping Mulla Mulla)			
70.	2721 <i>Ptilotus exaltatus</i> (Tall Mulla Mulla)			
71.	2725 <i>Ptilotus fusiformis</i>			
72.	2761 <i>Ptilotus spicatus</i>			
73.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
74.	30434 <i>Salsola australis</i>			
75.	13176 <i>Scaevola laciniata</i>			
76.	16257 <i>Schoenoplectus subulatus</i>			
77.	12312 <i>Senna notabilis</i>			
78.	12319 <i>Senna venusta</i>			
79.	<i>Sesbania</i> sp.			
80.	15110 <i>Sida laevis</i>			
81.	7002 <i>Solanum diversiflorum</i>			
82.	28345 <i>Spermocoe dolichosperma</i>			
83.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
84.	8240 <i>Streptoglossa odora</i>			
85.	7729 <i>Stylidium fluminense</i>			
86.	4261 <i>Tephrosia brachycarpa</i>			
87.	33486 <i>Tephrosia lasiochlaena</i>			
88.	4280 <i>Tephrosia rosea</i> (Flinders River Poison, Bungoo'dah)			
89.	4281 <i>Tephrosia simplicifolia</i>			
90.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
91.	4283 <i>Tephrosia stipuligera</i>			
92.	4285 <i>Tephrosia supina</i>			
93.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
94.	47242 <i>Trichodesma zeylanicum</i> var. <i>latiseipaleum</i>			
95.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
96.	5106 <i>Waltheria indica</i>			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.





NatureMap Flora Species Report 3

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 31' 18" E, 18° 27' 53" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	124	153
Priority 1	2	2
Priority 3	3	3
TOTAL	129	158

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandeme Grass)		P1	
2.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
3.	2458 <i>Atriplex flabelliformis</i>		P3	
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
6.	4896 <i>Abutilon leucopetalum</i> (Desert Chinese Lantern)			
7.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
8.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
9.	3222 <i>Acacia argyrea</i>			
10.	3241 <i>Acacia bivenosa</i>			
11.	46578 <i>Acacia citriodora</i>			
12.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
13.	3326 <i>Acacia eripoda</i> (Broome Pindan Wattle)			
14.	3447 <i>Acacia monticola</i> (Gawar, Lilwardi)			
15.	3556 <i>Acacia stenophylla</i> (Belale)			
16.	13070 <i>Acacia synchronica</i>			
17.	20321 <i>Acacia tumida</i> var. <i>kulpam</i>			
18.	19641 <i>Acacia tumida</i> var. <i>tumida</i>			
19.	31076 <i>Amaranthus cochleitepalus</i>			
20.	43105 <i>Apowollastonia cylindrica</i>			
21.	12063 <i>Aristida holathera</i> var. <i>holathera</i>			
22.	215 <i>Aristida latifolia</i> (Feathertop Wiregrass)			
23.	229 <i>Astrebula pectinata</i> (Barley Mitchell Grass)			
24.	230 <i>Astrebula squarrosa</i> (Bull Mitchell Grass)			
25.	4740 <i>Atalaya hemiglauca</i> (Whitewood)			
26.	5184 <i>Bergia pedicellaris</i>			
27.	2773 <i>Boerhavia paludosa</i>			
28.	15885 <i>Brunonia australis</i> var. <i>A Kimberley Flora (K.F. Kenneally 5452)</i>			
29.	750 <i>Bulbostylis barbata</i>			
30.	5457 <i>Calytrix exstipulata</i> (Kimberley Heather)			
31.	7369 <i>Citrullus colocynthis</i>	Y		
32.	18415 <i>Corchorus sidoides</i> subsp. <i>sidoides</i>			
33.	17092 <i>Corymbia opaca</i>			
34.	11903 <i>Crotalaria dissitiflora</i> subsp. <i>rugosa</i>			
35.	11993 <i>Crotalaria novae-hollandiae</i> subsp. <i>lasiophylla</i>			
36.	17117 <i>Cullen cinereum</i>			
37.	17434 <i>Cullen cuneatum</i>			
38.	17438 <i>Cullen plumosum</i>			
39.	17447 <i>Cullen pustulatum</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	280 <i>Cymbopogon bombycinus</i> (Silky Oilgrass)			
41.	12811 <i>Cyperus cunninghamii</i> subsp. <i>cunninghamii</i>			
42.	7424 <i>Dampiera candidans</i>			
43.	7318 <i>Dentella minutissima</i>			
44.	3856 <i>Desmodium muelleri</i>			
45.	313 <i>Digitaria ctenantha</i> (Comb Finger Grass)			
46.	4759 <i>Dodonaea coriacea</i>			
47.	4777 <i>Dodonaea polyzyga</i>			
48.	44508 <i>Duma florulenta</i>			
49.	2504 <i>Dysphania plantaginella</i>			
50.	328 <i>Echinochloa colona</i> (Awnless Barnyard Grass)	Y		
51.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
52.	395 <i>Eragrostis speciosa</i> (Handsome Lovegrass)			
53.	7183 <i>Eremophila bignoniiflora</i> (Gooramurra)			
54.	7234 <i>Eremophila longifolia</i> (Berrigan, Tulypurpa)			
55.	414 <i>Eriachne obtusa</i> (Northern Wandarrie Grass)			
56.	16485 <i>Eriachne pulchella</i> subsp. <i>dominii</i>			
57.	5566 <i>Eucalyptus brevifolia</i> (Snappy Gum)			
58.	5590 <i>Eucalyptus chlorophylla</i>			
59.	5603 <i>Eucalyptus coolabah</i> (Coolibah)			
60.	15187 <i>Eucalyptus limitaris</i>			
61.	4641 <i>Euphorbia schizolepis</i>			
62.	3884 <i>Flemingia pauciflora</i>			
63.	18372 <i>Gomphrena lanata</i>			
64.	7490 <i>Goodenia armitiana</i>			
65.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
66.	4910 <i>Gossypium australe</i> (Native Cotton)			
67.	1990 <i>Grevillea dimidiata</i> (Caustic Bush)			
68.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
69.	16476 <i>Grevillea refracta</i> subsp. <i>refracta</i>			
70.	2789 <i>Gyrostemon tepperi</i>			
71.	2129 <i>Hakea arborescens</i> (Common Hakea)			
72.	10992 <i>Heliotropium glabellum</i>			
73.	17306 <i>Heliotropium haesum</i>			Y
74.	4933 <i>Hibiscus leptocladus</i>			
75.	5215 <i>Hybanthus aurantiacus</i>			
76.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
77.	3982 <i>Indigofera monophylla</i>			
78.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
79.	457 <i>Isellema ciliatum</i>			
80.	11567 <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>			
81.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
82.	5942 <i>Melaleuca nervosa</i> (Fibrebark)			
83.	5051 <i>Melhania oblongifolia</i>			
84.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
85.	3615 <i>Neptunia gracilis</i> (Native Sensitive Plant)			
86.	3617 <i>Neptunia monosperma</i>			
87.	3674 <i>Petalostylis cassioides</i>			
88.	17816 <i>Pluchea ferdinandi-muelleri</i>			
89.	41221 <i>Pterocaulon serrulatum</i> var. <i>velutinum</i>			
90.	2695 <i>Ptilotus arthrolasius</i>			
91.	2704 <i>Ptilotus calostachyus</i> (Weeping Mulla Mulla)			
92.	2721 <i>Ptilotus exaltatus</i> (Tail Mulla Mulla)			
93.	2725 <i>Ptilotus fusiformis</i>			
94.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
95.	2761 <i>Ptilotus spicatus</i>			
96.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
97.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
98.	30434 <i>Salsola australis</i>			
99.	13176 <i>Scaevola laciniata</i>			
100.	7633 <i>Scaevola parvifolia</i> (Camel Weed)			
101.	16257 <i>Schoenoplectus subulatus</i>			
102.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			
103.	12312 <i>Senna notabilis</i>			
104.	12319 <i>Senna venusta</i>			
105.	46821 <i>Seringia nephrosperma</i> (Free carpel fire-bush)			
106.	4196 <i>Sesbania cannabina</i> (Sesbania Pea)			
107.	<i>Sesbania</i> sp.			
108.	15110 <i>Sida laevis</i>			
109.	7002 <i>Solanum diversiflorum</i>			

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Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
110.	28345 <i>Spermacoe dolichosperma</i>			
111.	43943 <i>Sphaeromorphaea littoralis</i>			
112.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
113.	8240 <i>Streptoglossa odora</i>			
114.	4252 <i>Templetonia egena</i> (Round Templetonia)			
115.	4261 <i>Tephrosia brachycarpa</i>			
116.	33486 <i>Tephrosia lasiochlaena</i>			
117.	4280 <i>Tephrosia rosea</i> (Flinders River Poison, Bungoo'dah)			
118.	4281 <i>Tephrosia simplicifolia</i>			
119.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
120.	4283 <i>Tephrosia stipuligera</i>			
121.	4285 <i>Tephrosia supina</i>			
122.	5298 <i>Terminalia arostrata</i> (Crocodile Tree)			
123.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
124.	696 <i>Triodia pungens</i> (Soft Spinifex)			
125.	4880 <i>Triumfetta micracantha</i>			
126.	4881 <i>Triumfetta plumigera</i>			
127.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
128.	5106 <i>Waltheria indica</i>			
129.	729 <i>Xerochloa barbata</i> (Rice Grass)			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.





NatureMap Flora Species Report 4

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 32' 59" E, 18° 39' 28" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	89	111
Priority 1	2	2
Priority 3	3	3
TOTAL	94	116

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandeme Grass)		P1	
2.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
3.	2458 <i>Atriplex flabelliformis</i>		P3	
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
6.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
7.	3209 <i>Acacia ampliceps</i>			
8.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
9.	3222 <i>Acacia argyrea</i>			
10.	3241 <i>Acacia bivenosa</i>			
11.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
12.	3302 <i>Acacia difficilis</i>			
13.	3326 <i>Acacia eripoda</i> (Broome Pindan Wattle)			
14.	3447 <i>Acacia monticola</i> (Gawar, Lilwardi)			
15.	3491 <i>Acacia platycarpa</i> (Pindan Wattle)			
16.	3556 <i>Acacia stenophylla</i> (Belalie)			
17.	13070 <i>Acacia synchronicia</i>			
18.	20321 <i>Acacia tumida</i> var. <i>kulpam</i>			
19.	19641 <i>Acacia tumida</i> var. <i>tumida</i>			
20.	5184 <i>Bergia pedicellaris</i>			
21.	15885 <i>Brunonia australis</i> var. <i>A Kimberley Flora (K.F. Kenneally 5452)</i>			
22.	750 <i>Bulbostylis barbata</i>			
23.	5457 <i>Calytrix exstipulata</i> (Kimberley Heather)			
24.	11993 <i>Crotalaria novae-hollandiae</i> subsp. <i>lasiophylla</i>			
25.	19398 <i>Crotalaria ramosissima</i>			
26.	17117 <i>Cullen cinereum</i>			
27.	17434 <i>Cullen cuneatum</i>			
28.	280 <i>Cymbopogon bombycinus</i> (Silky Oilgrass)			
29.	7424 <i>Dampiera candidans</i>			
30.	7318 <i>Dentella minutissima</i>			
31.	313 <i>Digitaria ctenantha</i> (Comb Finger Grass)			
32.	4759 <i>Dodonaea coriacea</i>			
33.	44508 <i>Duma florulenta</i>			
34.	2504 <i>Dysphania plantaginella</i>			
35.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
36.	395 <i>Eragrostis speciosa</i> (Handsome Lovegrass)			
37.	7183 <i>Eremophila bignoniiflora</i> (Gooramurra)			
38.	7234 <i>Eremophila longifolia</i> (Berrigan, Tullypurpa)			
39.	414 <i>Eriachne obtusa</i> (Northern Wandarie Grass)			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	16485 <i>Eriachne pulchella</i> subsp. <i>dominii</i>			
41.	5590 <i>Eucalyptus chlorophylla</i>			
42.	5603 <i>Eucalyptus coolabah</i> (Coolibah)			
43.	15187 <i>Eucalyptus limitaris</i>			
44.	4641 <i>Euphorbia schizolepis</i>			
45.	18372 <i>Gomphrena lanata</i>			
46.	7490 <i>Goodenia armitiana</i>			
47.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
48.	4910 <i>Gossypium australe</i> (Native Cotton)			
49.	4913 <i>Gossypium hirsutum</i> (Upland Cotton)	Y		
50.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
51.	16476 <i>Grevillea refracta</i> subsp. <i>refracta</i>			
52.	2789 <i>Gyrostemon tepperi</i>			
53.	17494 <i>Halgania solanacea</i> var. <i>solanacea</i>			
54.	10992 <i>Heliotropium glabellum</i>			
55.	17306 <i>Heliotropium haesum</i>			Y
56.	4933 <i>Hibiscus leptocladus</i>			
57.	5215 <i>Hybanthus aurantiacus</i>			
58.	3982 <i>Indigofera monophylla</i>			
59.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
60.	457 <i>Iselema ciliatum</i>			
61.	11567 <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>			
62.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
63.	5942 <i>Melaleuca nervosa</i> (Fibre bark)			
64.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
65.	4518 <i>Owenia reticulata</i> (Native Walnut, Bandal)			
66.	4670 <i>Petalostigma nummularium</i>			
67.	3674 <i>Petalostylis cassioides</i>			
68.	19744 <i>Pittosporum angustifolium</i>			
69.	17816 <i>Pluchea ferdinandi-muelleri</i>			
70.	2695 <i>Ptilotus arthrolasius</i>			
71.	2725 <i>Ptilotus fusiformis</i>			
72.	2726 <i>Ptilotus gardneri</i>			
73.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
74.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
75.	13176 <i>Scaevola laciniata</i>			
76.	7633 <i>Scaevola parvifolia</i> (Camel Weed)			
77.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			
78.	12309 <i>Senna glutinosa</i> subsp. <i>pruinosa</i>			
79.	46821 <i>Seringia nephrosperma</i> (Free carpel fire-bush)			
80.	4196 <i>Sesbania cannabina</i> (Sesbania Pea)			
81.	43943 <i>Sphaeromorphaea littoralis</i>			
82.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
83.	4252 <i>Templetonia egena</i> (Round Templetonia)			
84.	4261 <i>Tephrosia brachycarpa</i>			
85.	33486 <i>Tephrosia lasiochlaena</i>			
86.	4281 <i>Tephrosia simplicifolia</i>			
87.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
88.	4285 <i>Tephrosia supina</i>			
89.	5298 <i>Terminalia arostrata</i> (Crocodile Tree)			
90.	696 <i>Triodia pungens</i> (Soft Spinifex)			
91.	4880 <i>Triumfetta micracantha</i>			
92.	4881 <i>Triumfetta plumigera</i>			
93.	5106 <i>Waltheria indica</i>			
94.	729 <i>Xerochloa barbata</i> (Rice Grass)			

Conservation Codes
 T - Rare or likely to become extinct
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 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.





NatureMap Flora Species Report 5

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 34' 17" E, 18° 42' 04" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	82	103
Priority 1	2	2
Priority 3	3	3
TOTAL	87	108

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandernie Grass)		P1	
2.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
3.	2458 <i>Atriplex flabelliformis</i>		P3	
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
6.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
7.	3209 <i>Acacia ampliceps</i>			
8.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
9.	3222 <i>Acacia argyrea</i>			
10.	3241 <i>Acacia bivenosa</i>			
11.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
12.	3302 <i>Acacia difficilis</i>			
13.	3326 <i>Acacia eripoda</i> (Broome Pindan Wattle)			
14.	3447 <i>Acacia monticola</i> (Gawar, Lilwardi)			
15.	3491 <i>Acacia platycarpa</i> (Pindan Wattle)			
16.	3556 <i>Acacia stenophylla</i> (Belalie)			
17.	13070 <i>Acacia synchronicia</i>			
18.	20321 <i>Acacia tumida</i> var. <i>kulpam</i>			
19.	19641 <i>Acacia tumida</i> var. <i>tumida</i>			
20.	15885 <i>Brunonia australis</i> var. <i>A Kimberley Flora (K.F. Kenneally 5452)</i>			
21.	5457 <i>Calytrix exstipulata</i> (Kimberley Heather)			
22.	11993 <i>Crotalaria novae-hollandiae</i> subsp. <i>lasiophylla</i>			
23.	19398 <i>Crotalaria ramosissima</i>			
24.	17117 <i>Cullen cinereum</i>			
25.	17434 <i>Cullen cuneatum</i>			
26.	280 <i>Cymbopogon bombycinus</i> (Silky Oilgrass)			
27.	7424 <i>Dampiera candidans</i>			
28.	7318 <i>Dentella minutissima</i>			
29.	4759 <i>Dodonaea coriacea</i>			
30.	44508 <i>Duma florulenta</i>			
31.	2504 <i>Dysphania plantaginella</i>			
32.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
33.	395 <i>Eragrostis speciosa</i> (Handsome Lovegrass)			
34.	7183 <i>Eremophila bignoniiflora</i> (Gooramurra)			
35.	414 <i>Eriachne obtusa</i> (Northern Wandernie Grass)			
36.	16485 <i>Eriachne pulchella</i> subsp. <i>dominii</i>			
37.	5603 <i>Eucalyptus coolabah</i> (Coolibah)			
38.	4641 <i>Euphorbia schizolepis</i>			
39.	18372 <i>Gomphrena lanata</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	7490 <i>Goodenia armitiana</i>			
41.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
42.	4910 <i>Gossypium australe</i> (Native Cotton)			
43.	4913 <i>Gossypium hirsutum</i> (Upland Cotton)	Y		
44.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
45.	16476 <i>Grevillea refracta</i> subsp. <i>refracta</i>			
46.	2789 <i>Gyrostemon tepperi</i>			
47.	17494 <i>Halgania solanacea</i> var. <i>solanacea</i>			
48.	10992 <i>Heliotropium glabellum</i>			
49.	17306 <i>Heliotropium haesum</i>			Y
50.	4933 <i>Hibiscus leptocladus</i>			
51.	5215 <i>Hybanthus aurantiacus</i>			
52.	3982 <i>Indigofera monophylla</i>			
53.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
54.	457 <i>Iseilema ciliatum</i>			
55.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
56.	5942 <i>Melaleuca nervosa</i> (Fibrebark)			
57.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
58.	4518 <i>Owenia reticulata</i> (Native Walnut, Bandal)			
59.	4670 <i>Petalostigma nummularium</i>			
60.	3674 <i>Petalostylis cassioides</i>			
61.	19744 <i>Pittosporum angustifolium</i>			
62.	17816 <i>Pluchea ferdinandi-muelleri</i>			
63.	2695 <i>Ptilotus arthrolasius</i>			
64.	2725 <i>Ptilotus fusiformis</i>			
65.	2726 <i>Ptilotus gardneri</i>			
66.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
67.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
68.	13176 <i>Scaevola laciniata</i>			
69.	7633 <i>Scaevola parvifolia</i> (Camel Weed)			
70.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			
71.	12309 <i>Senna glutinosa</i> subsp. <i>pruinosa</i>			
72.	46821 <i>Seringia nephrosperma</i> (Free carpel fire-bush)			
73.	4196 <i>Sesbania cannabina</i> (Sesbania Pea)			
74.	43943 <i>Sphaeromorphaea littoralis</i>			
75.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
76.	4252 <i>Templetonia egena</i> (Round Templetonia)			
77.	4261 <i>Tephrosia brachycarpa</i>			
78.	33486 <i>Tephrosia lasiochlaena</i>			
79.	4281 <i>Tephrosia simplicifolia</i>			
80.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
81.	4285 <i>Tephrosia supina</i>			
82.	5298 <i>Terminalia arostrata</i> (Crocodile Tree)			
83.	696 <i>Triodia pungens</i> (Soft Spinifex)			
84.	4880 <i>Triumfetta micracantha</i>			
85.	4881 <i>Triumfetta plumigera</i>			
86.	5106 <i>Waltheria indica</i>			
87.	729 <i>Xerochloa barbata</i> (Rice Grass)			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.





NatureMap Flora Species Report 6

Created By Guest user on 24/04/2020

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 36' 59" E, 18° 47' 31" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	130	157
Priority 1	2	2
Priority 3	4	4
TOTAL	136	163

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Priority 1				
1.	401 <i>Eriachne armitii</i> (Longawn Wandernie Grass)		P1	
2.	3065 <i>Rorippa eustylis</i>		P1	Y
Priority 3				
3.	2458 <i>Atriplex flabelliformis</i>		P3	
4.	17611 <i>Eragrostis confertiflora</i>		P3	
5.	19121 <i>Goodenia crenata</i>		P3	
6.	19594 <i>Iotasperma sessilifolium</i>		P3	
Non-conservation taxon				
7.	4898 <i>Abutilon macrum</i>			
8.	11215 <i>Acacia adoxa</i> var. <i>adoxo</i>			
9.	3209 <i>Acacia ampliceps</i>			
10.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
11.	3222 <i>Acacia argyraea</i>			
12.	3241 <i>Acacia bivenosa</i>			
13.	15280 <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>			
14.	3302 <i>Acacia difficilis</i>			
15.	16174 <i>Acacia elachantha</i>			
16.	3370 <i>Acacia hilliana</i>			
17.	3430 <i>Acacia lysiphloia</i> (Turpentine Wattle)			
18.	3447 <i>Acacia monticola</i> (Gawar, Lilward)			
19.	13401 <i>Acacia neurocarpa</i>			
20.	3471 <i>Acacia orthocarpa</i> (Needleleaf Wattle)			
21.	3491 <i>Acacia platycarpa</i> (Pindan Wattle)			
22.	3556 <i>Acacia stenophylla</i> (Belalie)			
23.	13070 <i>Acacia synchronica</i>			
24.	20321 <i>Acacia tumida</i> var. <i>kulpam</i>			
25.	19641 <i>Acacia tumida</i> var. <i>tumida</i>			
26.	2651 <i>Alternanthera nana</i> (Hairy Joyweed)			
27.	20018 <i>Amaranthus undulatus</i>			
28.	206 <i>Aristida capillifolia</i> (Needle-leaved Threawn)			
29.	6606 <i>Bonamia media</i>			
30.	15885 <i>Brunonia australis</i> var. <i>A Kimberley Flora (K.F. Kenneally 5452)</i>			
31.	7048 <i>Buchnera ramosissima</i> (Blackrod)			
32.	5457 <i>Calytrix exstipulata</i> (Kimberley Heather)			
33.	6567 <i>Carissa lanceolata</i> (Conkerberry, Mamuwiji)			
34.	18358 <i>Chamaecrista absus</i> var. <i>absus</i>			
35.	4863 <i>Corchorus pumilio</i>			
36.	18415 <i>Corchorus sidoides</i> subsp. <i>sidoides</i>			
37.	17073 <i>Corymbia aspera</i>			
38.	17092 <i>Corymbia opaca</i>			
39.	19398 <i>Crotalaria ramosissima</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity,
Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	41720 <i>Cucumis argenteus</i>			
41.	17117 <i>Cullen cinereum</i>			
42.	17434 <i>Cullen cuneatum</i>			
43.	280 <i>Cymbopogon bombycinus</i> (Silky Oilgrass)			
44.	282 <i>Cymbopogon procerus</i> (Lemon Grass)			
45.	12806 <i>Cyperus microcephalus</i> subsp. <i>chersophilus</i>			
46.	7424 <i>Dampiera candidans</i>			
47.	7317 <i>Dentella asperata</i>			
48.	7318 <i>Dentella minutissima</i>			
49.	4759 <i>Dodonaea coriacea</i>			
50.	4777 <i>Dodonaea polyzyga</i>			
51.	44508 <i>Duma florulenta</i>			
52.	2504 <i>Dysphania plantaginella</i>			
53.	12749 <i>Erneapogon purpurascens</i> (Purple Nineawn)			
54.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
55.	395 <i>Eragrostis speciosa</i> (Handsome Lovegrass)			
56.	7183 <i>Eremophila bignoniiflora</i> (Gooramurra)			
57.	17169 <i>Eremophila latrobei</i> subsp. <i>glabra</i>			
58.	400 <i>Eriachne aristidea</i>			
59.	414 <i>Eriachne obtusa</i> (Northern Wandarrie Grass)			
60.	5566 <i>Eucalyptus brevifolia</i> (Snappy Gum)			
61.	5603 <i>Eucalyptus coolabah</i> (Coolibah)			
62.	5609 <i>Eucalyptus cupularis</i> (Halls Creek White Gum)			
63.	4641 <i>Euphorbia schizolepis</i>			
64.	12097 <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Desert Spurge)			
65.	11200 <i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			
66.	12159 <i>Fimbristylis simulans</i>			
67.	18363 <i>Gomphrena canescens</i> subsp. <i>canescens</i>			
68.	7490 <i>Goodenia armitiana</i>			
69.	7545 <i>Goodenia scaevolina</i> (Ngurubi)			
70.	4910 <i>Gossypium australe</i> (Native Cotton)			
71.	4913 <i>Gossypium hirsutum</i> (Upland Cotton)	Y		
72.	19570 <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>			
73.	16476 <i>Grevillea refracta</i> subsp. <i>refracta</i>			
74.	13440 <i>Grevillea wickhamii</i> subsp. <i>aprica</i>			
75.	2789 <i>Gyrostemon lepperi</i>			
76.	2178 <i>Hakea macrocarpa</i> (Dyaridany, Jaradinty)			
77.	17494 <i>Halgania solanacea</i> var. <i>solanacea</i>			
78.	10992 <i>Heliotropium glabellum</i>			
79.	17306 <i>Heliotropium haesum</i>			Y
80.	17315 <i>Heliotropium tanythrix</i>			
81.	4933 <i>Hibiscus leptocladus</i>			
82.	5215 <i>Hybanthus aurantiacus</i>			
83.	3982 <i>Indigofera monophylla</i>			
84.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
85.	457 <i>Iseilema ciliatum</i>			
86.	6135 <i>Ludwigia octovalvis</i> (Willow Primrose)			
87.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
88.	12949 <i>Marsdenia australis</i>			
89.	5942 <i>Melaleuca nervosa</i> (Fibre bark)			
90.	7337 <i>Nauclea orientalis</i> (Leichardt Pine)			
91.	12499 <i>Oldenlandia spermacocoides</i>			
92.	4518 <i>Owenia reticulata</i> (Native Walnut, Banda)			
93.	4670 <i>Petalostigma nummularium</i>			
94.	3674 <i>Petalostylis cassioides</i>			
95.	14462 <i>Phyllanthus exilis</i>			
96.	19744 <i>Pittosporum angustifolium</i>			
97.	17816 <i>Pluchea ferdinandi-muelleri</i>			
98.	8170 <i>Pluchea tetranthera</i>			
99.	2902 <i>Polycarpaea involucrata</i>			
100.	41221 <i>Pterocaulon serrulatum</i> var. <i>velutinum</i>			
101.	2695 <i>Ptilotus arthrolasius</i>			
102.	2696 <i>Ptilotus astrofasius</i>			
103.	2704 <i>Ptilotus calostachyus</i> (Weeping Mulla Mulla)			
104.	2726 <i>Ptilotus gardneri</i>			
105.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
106.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
107.	8198 <i>Rutidosis helichrysoides</i> (Grey Winklewort)			
108.	7633 <i>Scaevola parvifolia</i> (Camel Weed)			
109.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.



Department of Biodiversity, Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
110.	12307 <i>Senna glutinosa subsp. glutinosa</i>			
111.	12309 <i>Senna glutinosa subsp. pruinosa</i>			
112.	12319 <i>Senna venusta</i>			
113.	46821 <i>Seringia nephrosperma</i> (Free carpel fire-bush)			
114.	4196 <i>Sesbania cannabina</i> (Sesbania Pea)			
115.	31854 <i>Sida sp. Excedentifolia</i> (J.L. Egan 1925)			
116.	619 <i>Sorghum plumosum</i> (Plume Canegrass)			
117.	43943 <i>Sphaeromorphaea littoralis</i>			
118.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
119.	4731 <i>Stackhousia intermedia</i>			
120.	7101 <i>Stemodia lythrifolia</i> (Bunu Bunu)			
121.	41600 <i>Stemodia sp. Tanami</i> (P.K. Latz 8218)			
122.	3182 <i>Stylobasium spathulatum</i> (Pebble Bush)			
123.	4252 <i>Templetonia egena</i> (Round Templetonia)			
124.	4261 <i>Tephrosia brachycarpa</i>			
125.	33486 <i>Tephrosia lasiochlaena</i>			
126.	17768 <i>Tephrosia sp. Bungaroo Creek</i> (M.E. Trudgen 11601)			
127.	5298 <i>Terminalia arostrata</i> (Crocodile Tree)			
128.	11750 <i>Trichodesma zeylanicum var. zeylanicum</i>			
129.	48201 <i>Trigastrotheca molluginea</i>			
130.	17889 <i>Triodia bitextura</i>			
131.	686 <i>Triodia intermedia</i> (Lobed Spinifex)			
132.	696 <i>Triodia pungens</i> (Soft Spinifex)			
133.	4880 <i>Triumfetta micracantha</i>			
134.	4881 <i>Triumfetta plumigera</i>			
135.	5106 <i>Waltheria indica</i>			
136.	729 <i>Xerochloa barbata</i> (Rice Grass)			

Conservation Codes
 T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under international agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



Appendix 2: DoEE Protected Matters Search Tool Results



Australian Government
Department of the Environment and Energy

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: 25/03/20 12:38:25

[Summary](#)

[Details](#)

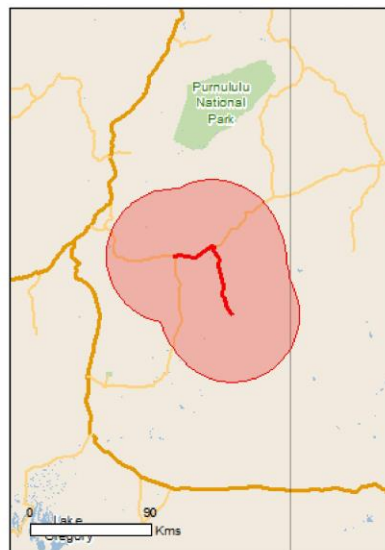
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[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:	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	8
Listed Migratory Species:	11

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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	1
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Lakes argyle and kununurra	100 - 150km upstream	
Ord river floodplain	200 - 300km upstream	

Listed Threatened Species			[Resource Information]
Name	Status	Type of Presence	
Birds			
Calidris ferruginea			
Curllew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	
Erythrotriorchis radiatus			
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area	
Erythrura gouldiae			
Gouldian Finch [413]	Endangered	Species or species habitat known to 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 may occur within area	

Mammals			
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	
Macrotis lagotis			
Greater Bilby [282]	Vulnerable	Species or species habitat known to 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	

Name	Threatened	Type of Presence area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

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		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
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 likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within

Name	Threatened	Type of Presence area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
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 may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may 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
Ord River Regeneration Reserve	WA

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		
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Frogs

<i>Rhinella marina</i> Cane Toad [83218]		Species or species habitat may occur within
---	--	---

Name	Status	Type of Presence 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
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
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		
Brachiaria mutica Para Grass [5879]		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
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		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

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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

-18.420445 128.222636,-18.421096 128.240489,-18.417188 128.253535,-18.429565 128.366832,-18.359848 128.480815,-18.36441 128.497294,-18.377443 128.491801,-18.408718 128.502787,-18.436079 128.527507,-18.479067 128.523387,-18.610567 128.553599,-18.66522 128.543986,-18.674328 128.556346,-18.717255 128.575572,-18.732212 128.574199,-18.745217 128.578318,-18.75562 128.592051,-18.792676 128.615397

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](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [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
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- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- 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.

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Appendix 3: Land System Descriptions (Schoknecht and Payne 2011)

Land systems of the Kimberley Region

GEEBEE LAND SYSTEM (Gbe)

2642 km²

Source: OVC

Many small and large areas of gently undulating gravelly red 'deserts' with shrub or woodland vegetation scattered throughout the southern half of the Ord-Victoria survey area.

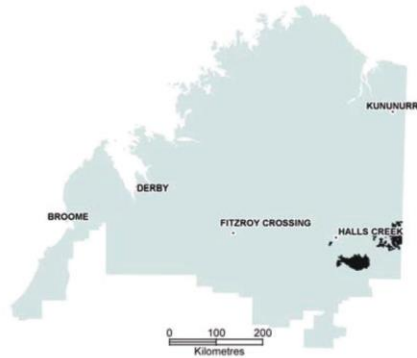
State land type: Undulating plains and uplands with eucalypt woodlands and spinifex.

Geology: Tertiary laterite and associated soils overlie Lower Cambrian volcanics, Adelaidean sediments, and Lower Proterozoic granite, gabbro, and metamorphic rocks.

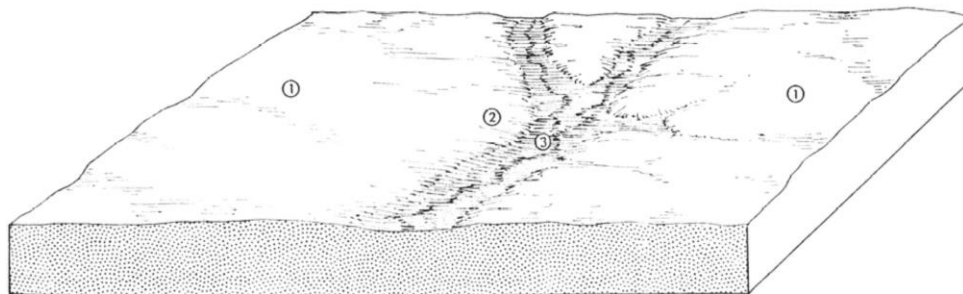
Geomorphology: Elevated lateritic plain (lateritic red earth and lateritic podzolic surface horizon).

Drainage: Widely spaced insequent headwater tributaries of both coastal rivers and the inland-draining Hooker and Sturt Creeks.

Land management: Soft spinifex pastures generally resilient under appropriate management of fire regime and grazing pressure; low or very low susceptibility to erosion.



Gently undulating, very gravelly slopes and plains with snappy gum (Eucalyptus brevifolia) and soft spinifex (Triodia pungens) are characteristic of the Geebee land system. Photo: DAFWA



Stylised block diagram showing location of land units

GEEBEE LAND SYSTEM (Gbe) – land units

Unit	Approx. area (%)	Landforms	Soils	Vegetation	Pasture type ⁺
1	80	Upper slopes and crests	Wonorah, shallow phase - red-brown clay loam with much ferruginous gravel.	Snappy gum sparse low woodland (<i>Eucalyptus brevifolia</i>) or stringybark-bloodwood woodland (<i>Corymbia dichromophloia</i>) with soft spinifex (<i>Triodia pungens</i>).	SSPP 60% HSPP 40%
2	10	Gently lower slopes	Wonorah - brown sandy loam merging into dark red clay over laterites.	Silver-leaved box sparse low woodland (<i>E. pruinosa</i>), or bloodwood-southern box sparse low woodland (<i>E. limitaris</i> or <i>E. tephrodes</i>) with threeawn mid-height grass (<i>Aristida pruinosa</i>).	HSPP 50% TAPP 50%
3	10	Shallow linear depressions with narrow shallow streamlines	Elliott - grey sandy loam merging into mottled yellow clay.	As for unit 2.	RGRP

+ Pasture types described in Appendix 1.

Land systems of the Kimberley Region

INVERWAY LAND SYSTEM (Inv)

3360 km²

Source: OVC

Nearly treeless high-level 'black soil' plains scattered throughout the southern part of the Ord-Victoria survey area.

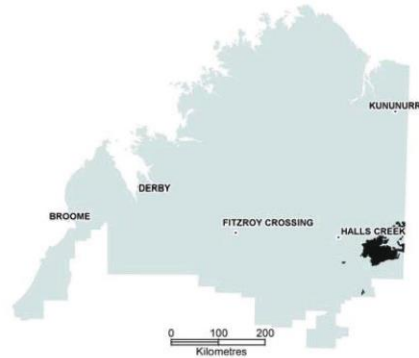
State land type: Alluvial plains with tussock grasslands.

Geology: Tertiary swamp, lake, and river deposits.

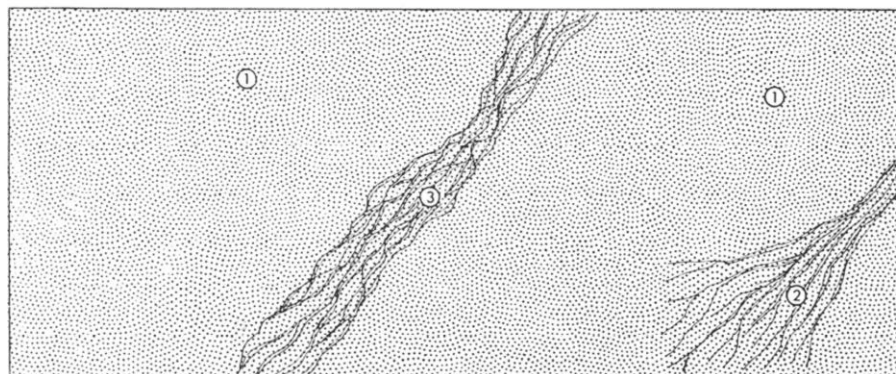
Geomorphology: Elevated non-lateritic plain (grey soils of heavy texture), interior fluvial plains, and interior swamp plains.

Drainage: Largely drained by insequent streamlines of the internally draining streams; the distributary systems are flooded for prolonged periods after heavy rain, the braided streams for short periods, and the nearly flat plains may be waterlogged, but not flooded, for short periods.

Land management: A system with high pastoral value; pastures preferentially grazed by cattle, control of grazing pressure is essential. Low susceptibility to erosion due to clay soils and level topography.



*Near level, treeless plains with dense tussock grasses on cracking clay soils of the Inverway land system.
Photo: Andrew Craig, DAFWA*



Stylised plan diagram showing arrangement of land units

INVERWAY LAND SYSTEM (Inv) – land units

Unit	Approx. area (%)	Landforms	Soils	Vegetation	Pasture type ⁺
1	90	Nearly flat broad plains	Cununurra - grey cracking clays; and Argyle - brown cracking clays.	Barley Mitchell mid-height grass (<i>Astrebla pectinata</i>).	MGAP
2	5	Low lying distributory areas with low linear rises and depressions	Cununurra - grey cracking clays.	Bluebush shrubland (<i>Chenopodium auricomum</i> , <i>Muehlenbeckia florulenta</i>).	OTHP
3	5	Linear tracts up to 800 m wide with intense braided pattern of small stream channels	Cununurra - grey cracking clays.	Fringing low woodland (<i>Eucalyptus microtheca</i> , <i>Acacia stenophylla</i>) with bluegrass tall grass (<i>Dichanthium fecundum</i> , <i>Themeda avenacea</i> , <i>Eulalia aurea</i>).	BGAP

Unmappable inclusion: Geebee. Comparable with Barkly land system of the Barkly region.

+ Pasture types described in Appendix 1.



The grey and brown clays (Vertosols) characteristic of unit 1 in Inverway land system shrink and crack in the dry season. The surface often spontaneously forms crumb-sized soil aggregates on drying - this surface condition is termed "self-mulching".

Self-mulching cracking clays are common in many land systems with gentle slopes and plains derived from basaltic or limestone parent material, including Argyle, Alexander, Fossil 2, Gogo, Isdell, Ivanhoe, Oscar, Wave Hill and other land systems.

Although these clays are usually grey or brown in colour they are collectively called "black soils" in the Kimberley.

Photo: Noel Schoknecht, DAFWA

Land systems of the Kimberley Region

WINNECKE LAND SYSTEM (Wnk)

3451 km²

Source: OVC

A number of irregular areas or linear bands of stony hills associated with the red sandy 'deserts' in the southern part of the Ord-Victoria survey area.

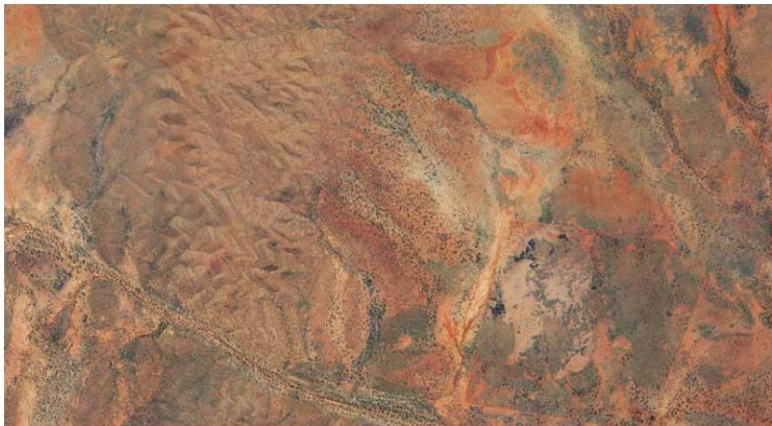
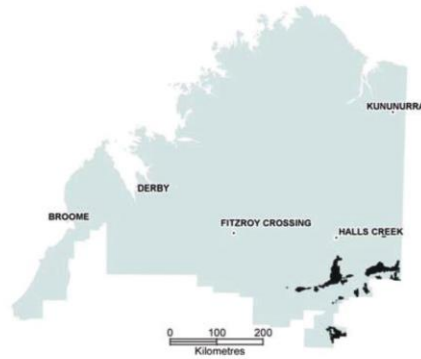
State land type: Hills and lowlands with eucalypt woodlands and spinifex

Geology: Mainly sandstone, some conglomerate and dolomite; Gardiner Beds of Carpentarian age.

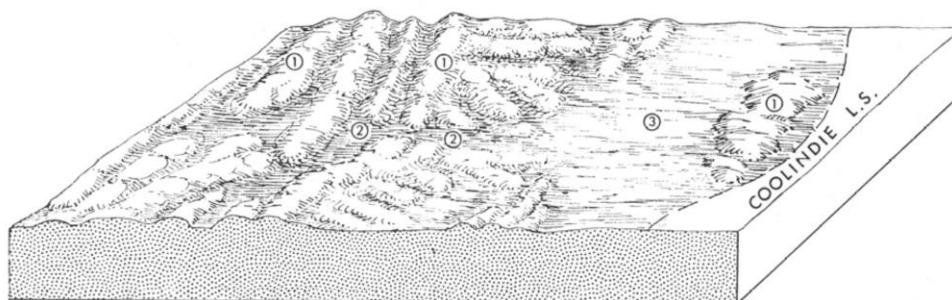
Geomorphology: Ancient monadnocks.

Drainage: Intensive parallel drainage on the first unit, widely spaced angular drainage on other units, generally terminating in deep sands at the base of hills.

Land management: System supports soft spinifex grasslands which are subject to frequent fires; these induce short term changes in botanical composition, density and structure. Young soft spinifex is moderately attractive to cattle; system generally has low or very low susceptibility to erosion except for some drainage floors which have moderate susceptibility. Controlled grazing desirable.



The description of the Winnecke land system in the text is inadequate to show the full complexity of land units seen in this image. Width of this 2005 aerial photograph is about 5.5 km. Photo: Landgate



Stylised block diagram showing location of land units

WINNECKE LAND SYSTEM (Wnk) – land units

Unit	Approx. area (%)	Landforms	Soils	Vegetation	Pasture type ⁺
1	65	Low linear or rounded hills	Outcrops of sandstone.	Trees absent or snappy gum sparse low woodland (<i>Eucalyptus brevifolia</i> , <i>E. aspera</i>) with soft spinifex (<i>Triodia pungens</i> , <i>T. spicata</i>).	SSPP
2	10	Gently sloping valley floors, mainly unchannelled	Cockatoo - deep red sandy soil, minor Elliott.	Desert shrubland (<i>Acacia</i> spp., <i>Eucalyptus</i> spp.) with soft spinifex (<i>Triodia pungens</i>).	SSPP 50% RGRP 50%
3	25	Gently sloping sandplain	Cockatoo - deep red sandy soil.	Desert shrubland (<i>Acacia</i> spp., <i>Eucalyptus</i> spp.) with soft spinifex (<i>Triodia pungens</i>).	SSPP

+ Pasture types described in Appendix 1.



Low rounded hills (unit 1) and gently sloping valley floors (unit 2) near Gumbo Point west of Balgo. Winnecke land system.

Photo: Berkeley Fitzhardinge (alias Yaruman5, Flickr.com)

Appendix 4: Other Site Photos

Site photos provided here are intended to provide additional context and is the basis for vegetation type characterisation.



Plate 10. V01 Vegetation type in the SLK 80-90 upgrade area, looking north



Plate 11. V03 vegetation type (recently burnt) in the SLK 0.74 Material Source Area, looking west



Plate 12. V01 vegetation type at the SLK 11 Material Source Area, looking west



Plate 13. V05 – Open Woodland over Tussock Grassland interface with V01 - Tussock Grassland, looking southeast



Plate 14. V08 vegetation at southern end of Development Envelope looking west



Plate 15. V05 at southern end of Development Envelope, looking east



Plate 16. V07 Vegetation Type in Southern Section of Project, looking south



Plate 17. V07 vegetation type looking west to interface with V05