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Duncan-Gordon Downs Road Upgrade – Stage 1

Desktop Fauna Assessment

April 2020

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Revisions

Revision Number	Revision Date	Description of Key Changes	Section / Page No.
Draft v1	23/04/2020	Draft Document for Review	-
v1	25/05/2020	Version for Issue	-

1 SUMMARY

This assessment characterised and mapped the range of fauna habitats present in the Duncan Gordon Downs Road Upgrade (DGDRU) Stage 1 Development Envelope based on desktop information and a site assessment. Seven habitat types were mapped and estimates of their extents within a 50km Desktop Assessment Area was made based on Land Systems. All habitat types were found to be common for the surrounding area.

The assessment also identified a suite of vertebrate fauna based on extensive database searches. A likelihood of occurrence assessment was carried out based on habitat requirements and availability of similar habitats within the Development Envelope.

Seven significant bird species are likely to occur or may occur and one was confirmed to occur in the Project's Development Envelope during site assessment (Glossy Ibis). Given their mobile nature, broad distributions and the large availability of habitat in the surrounding area, the habitats within the Development Area are not considered to be significant for these species.

Three significant mammals may occur: the Bilby, Lakeland Downs Mouse and Spectacled Hare Wallaby. These species were not recorded during the site assessment and the habitat surrounding the Development Envelope is same as if not better quality than within the Development Envelope.

Two reptiles, the Freshwater Crocodile and Gravel Dragon were both assessed as potentially occurring, however as above, the habitat within the Development Envelope is not considered unique for these species

2 INTRODUCTION

2.1 Purpose

This assessment is intended to provide information on fauna habitats, records and likelihood of occurrence for native vertebrate fauna.

This assessment covers select areas from the total 2020 Works Program, although the findings may be applicable in other areas (of similar habitat).

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 below..

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
Duncan Road SLK 114.26 – 116.04	1.7 ha	Minor realignment and floodway upgrade works required for safety purposes
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.

Work Area	Estimated Clearing*	Description
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	

* Based on habitat mapping; existing cleared areas are not included

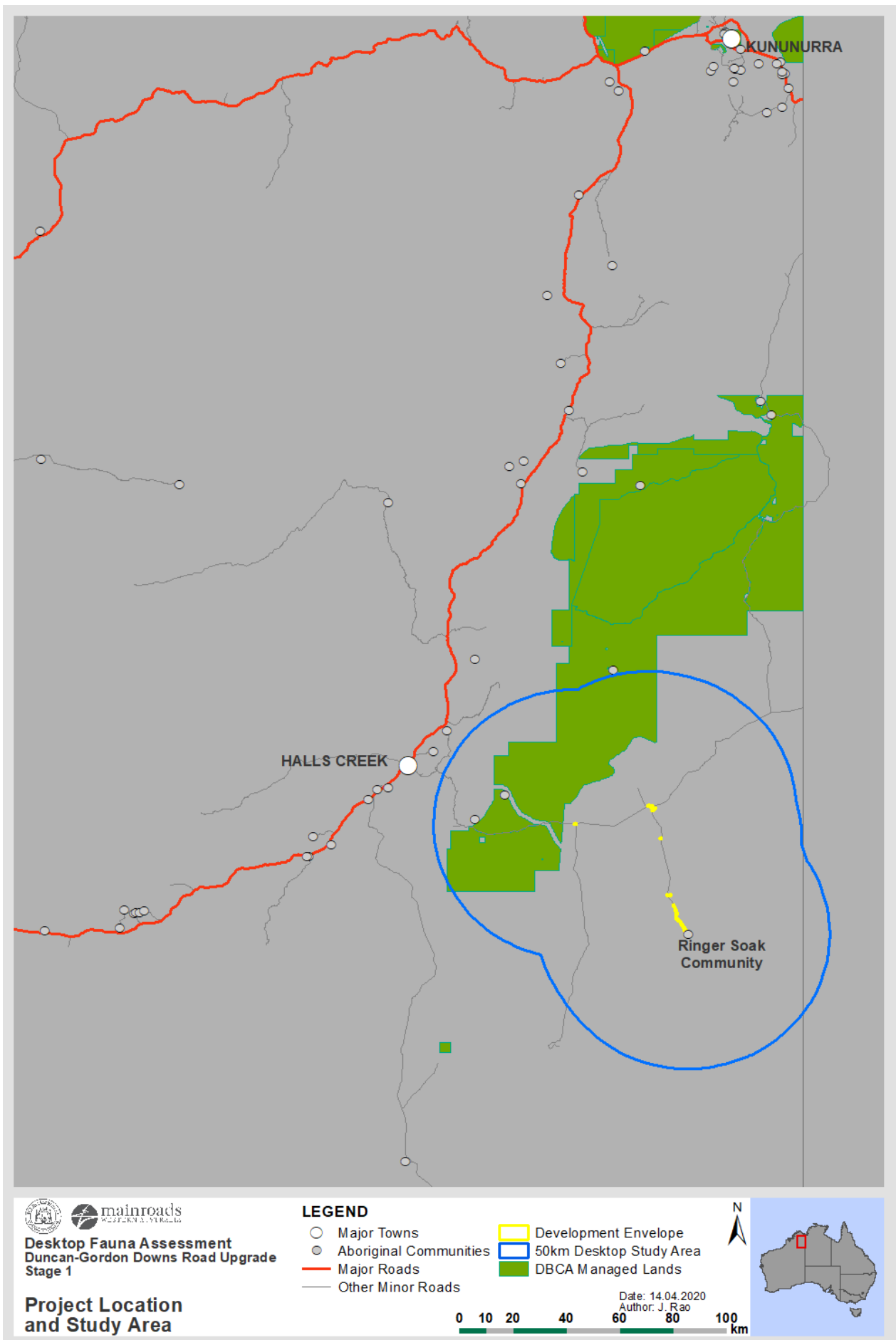


Figure 1. Project Location and Study Area

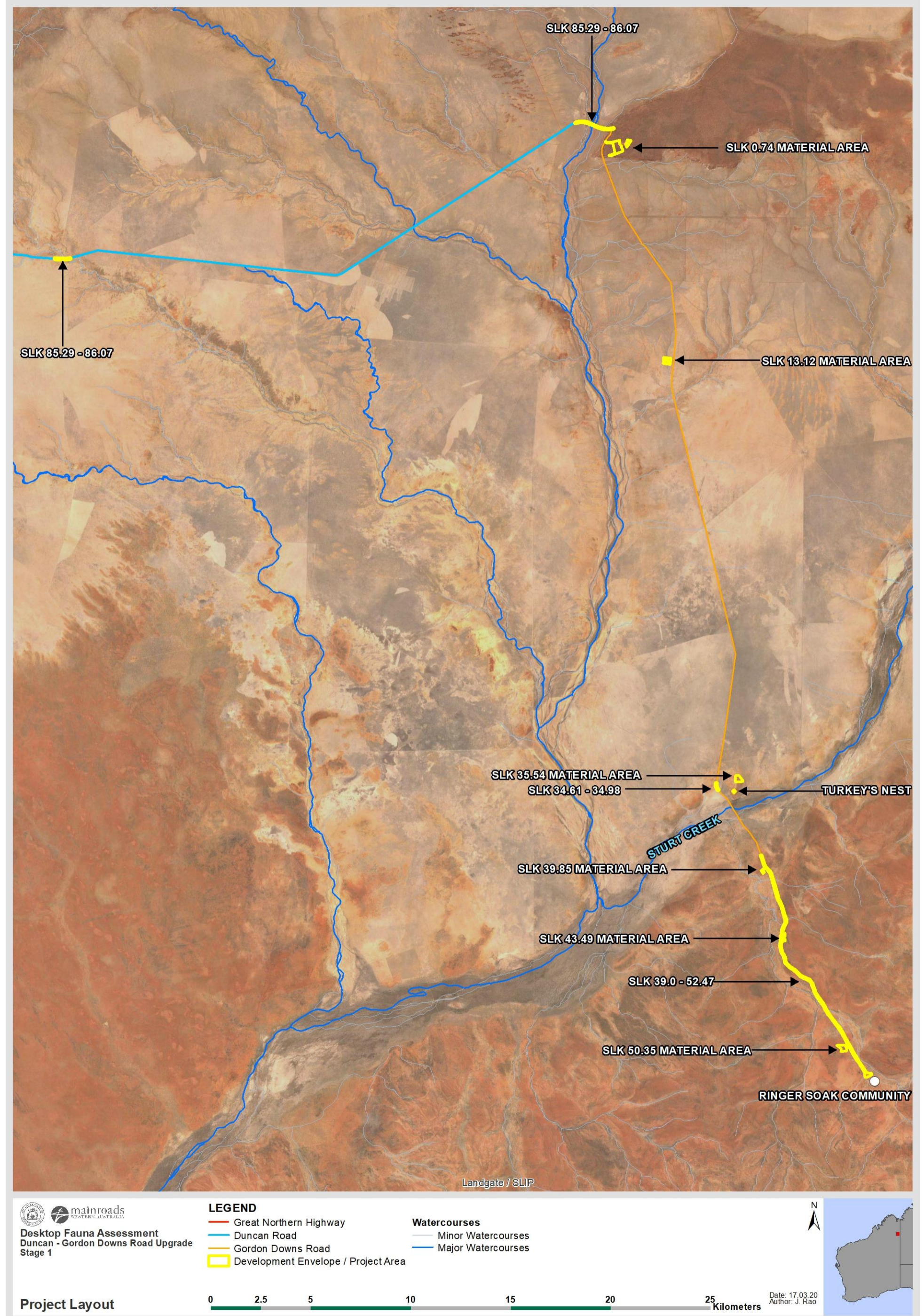


Figure 2. Project Layout

3 ASSESSMENT METHOD

The methods used for this assessment are as follows:

Desktop Assessment

1. Characterisation and quantification of broad habitat types within the Development Envelope, and the bioregion (Section 4).
2. Thorough database searches to identify species that have historically been detected in the vicinity of the area (within a nominal 50km radius), or could potentially occur based on available modelled distributions (Section 5.1);

Reconnaissance Site Assessment

3. A site assessment for Greater Bilby was conducted by John Silver, Main Roads Kimberley Project Environment Officer and zoologist Dr Richard Southgate from 13 – 14 March 2020. A further visit was carried out by Main Road's Kimberley Region's Environment Officer, JJ Rao between 1 - 2 April 2020. The objectives of this assessment were to:
 - a. Document and characterise fauna habitats present within the Project Area (Section 4.3);
 - b. Record signs of fauna opportunistically, by direct observation or sign evidence such as tracks/scats/burrows (Section 5.2);

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 6); and

3.1 Information Sources

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

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 in a 50km radius (fauna results are considered here).
2	NatureMAP	DBCA 2020a	Database search of known State records (limited to Kingdom Animalia). 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 Threatened Fauna Database	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	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. A portion of the survey area overlaps the DGDRU Stage 1 Envelope (within the Winnecke System). Used to inform habitat mapping.
5	Browns Range Rare Earth Project Terrestrial Vertebrate Fauna assessment	Outback Ecology 2014b	Fauna survey undertaken for the Browns Range Rare Earth mine. A portion of the survey area overlaps the DGDRU Stage 1 Envelope (within the Winnecke System). Used to inform habitat mapping and likelihood of occurrence.
6	Duncan/Gordon Downs Road Upgrade Project	Outback Ecology 2014c	Survey carried out by Outback Ecology in October 2014. Approximately 27% of the Development

Title	Source	Relevance	
Level 1 Vegetation, Flora and Fauna Survey		Envelope was surveyed. Used to inform habitat mapping.	
Distribution Modelling / Habitat Mapping			
7	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.
8	Species of National Environmental Significance (SNES) Database	DoEE 2018	Related to the PMST Database, the SNES database provides modelled distributions of core and non-core habitat for Federally listed species. This assists in the determining likelihood of occurrence.
9	Species Profiles and Threats (SPRAT) Database	DAWE 2020b	This database contains known information about the habitat, distribution and threats to Federally listed species. This assists in determining likelihood of occurrence and impacts.
10	Land Systems of the Kimberley Region	Schoknecht and Payne 2011	Detailed descriptions of vegetation, soils and landforms that are relevant in determining likelihood of occurrence.
On-site Surveys			
11	Report on a Bilby Survey in association with the Duncan-Gordon Downs Road Upgrade	Envisage Environmental Services 2020	Report on probability of occurrence for Greater Bilby based on site survey (Appendix 5).

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>Astrebula</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 4).

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.

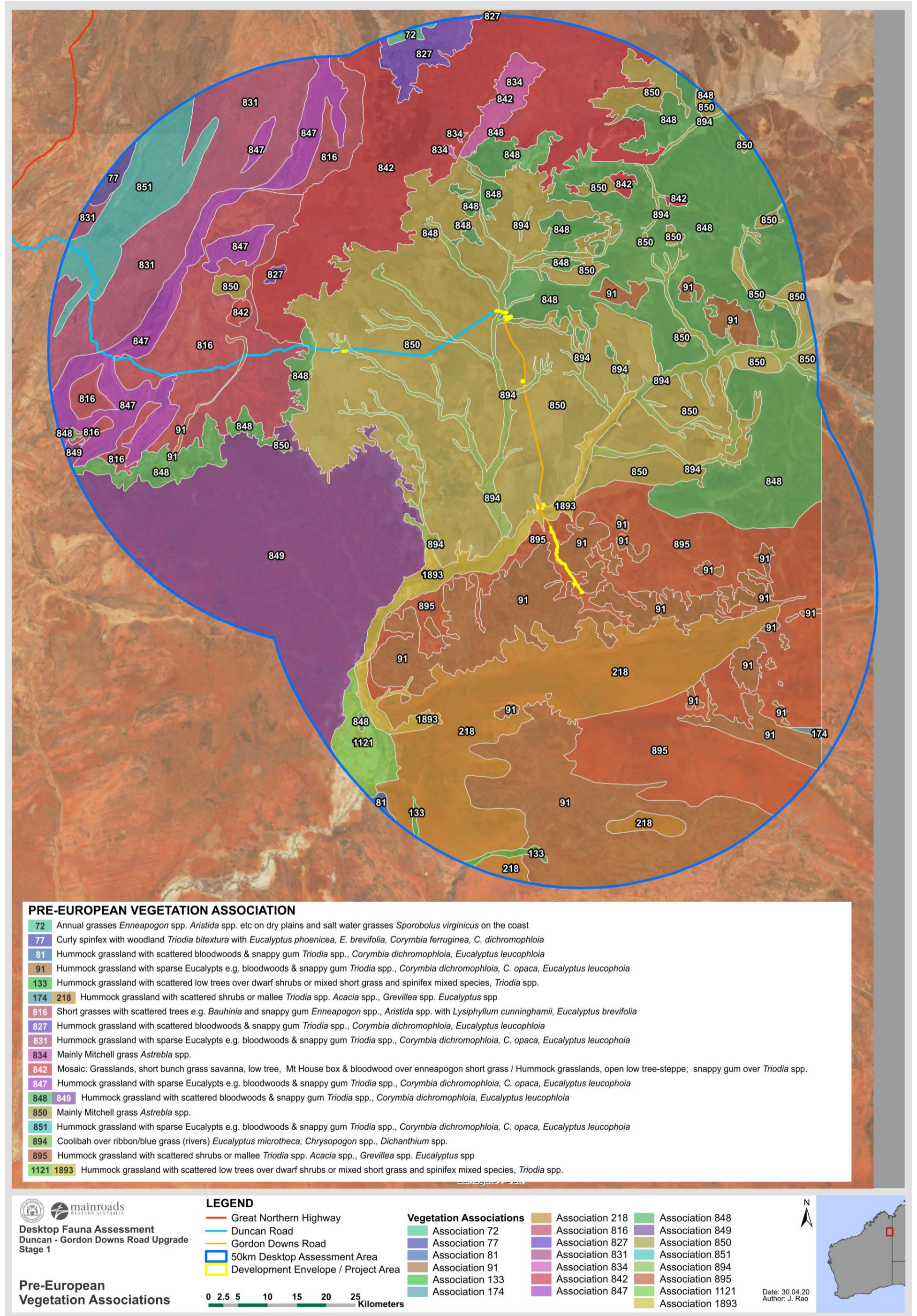


Figure 3. Pre-European Vegetation Associations

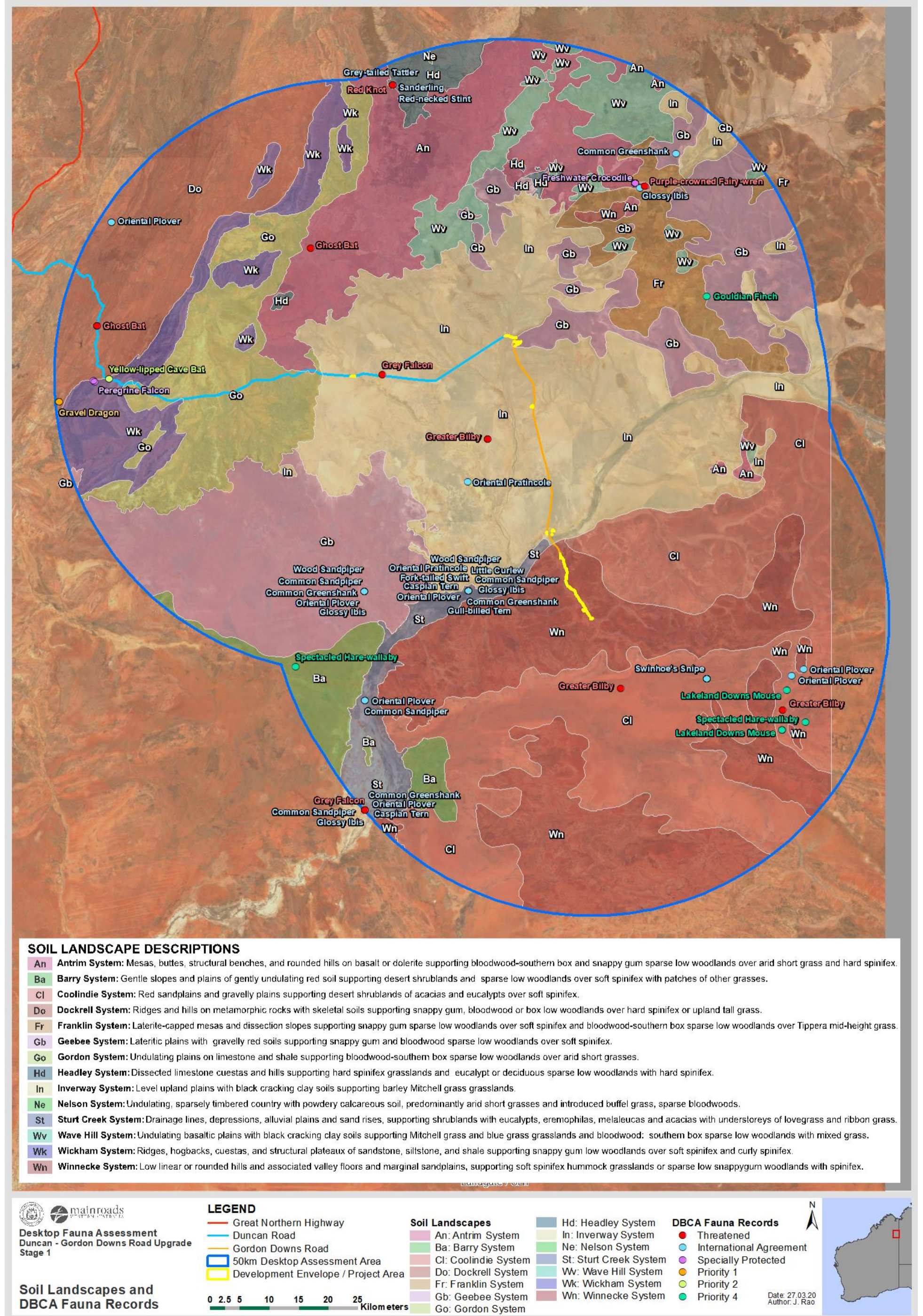


Figure 4. Soil Landscapes and DBCA Fauna Records

5 FAUNA HABITATS

Seven fauna habitats were mapped throughout the Development Envelope, described in Table 5, along the mapped extents. Habitat types in the Development Envelope are shown in the Figure 5 series.

Table 5 also provides an estimate of the extent of these seven habitat types within the 50km Desktop Area. It is worth noting that because the entire Desktop Area was not mapped for fine habitat types, land system characterisation work by Schoknecht and Payne (2011) was used to inform the extent. The area was compiled by calculating the approximate extent of the closest landform types in the three Land Systems to the seven fauna habitat types (landform types within each Land System is provided in the Appendix 4 extract.

Table 5. Fauna Habitats within the Development Envelope

Fauna Habitat	Associated Land System	Extent in Dev. Envelope	Estimated Extent ¹ in 50km Desktop Area)
Black Soil Plains – Plate 3 Minimal overstorey and midstorey, tussock grasslands over self-mulching cracking clay soils	Inverway (Unit 1: 90%)	27 ha	273,431 ha
Drainage Lines – Plate 4 Eucalypt lined clearly defined drainage lines with clayey or sandy banks	Inverway (Unit 3: 5%)	2.0 ha	15,191 ha
Lateritic Plains – Plate 5 Minimal Eucalypt overstorey over dense Acacia dominated midstorey over spinifex understorey on gravelly, sandy soils	Geebee (Unit 1: 80%)	32.3 ha	168,478 ha
Rocky Plains – Plate 2 Minimal Eucalypt overstorey, minimal Acacia midstorey and spinifex dominated understorey over rocky soils	Winnecke (Unit 1: 65%)	67.8 ha	130,887 ha
Saline Plains – Plate 7 Sparsely vegetated plains with mixed samphire and tussock grasses over saline, stony soils	Winnecke (Units 2: 3% used for estimates ²)	5.3 ha	6,041 ha
Sandstone Outcrops – Plate 1 Eucalypt overstorey, Acacia midstorey and Spinifex understorey over skeletal soils and sandstone outcrops.	Winnecke (Unit 1: 65%)	2 ha	130,887 ha
Sandy Plains – Plate 6 Minimal Eucalypt overstorey over sparse Acacia midstorey and tussock grass dominated understorey over sands with varying amounts of lateritic gravels	Winnecke (Units 2 & 3: 35%)	52.9 ha	70,478 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 This habitat type is closely related to the Sandy Plains Habitat but a specific corresponding landform is not detailed in Schoknecht and Payne (2011). This habitat type occurs within a small portion of Winnecke System Unit 2. Based on the site assessment of the Development Envelope, 9% of Winnecke System Units 2 and 3 were found to be Saline Plains (5.3 ha of a 62.1 ha total). Units 2 and 3 account for 35% of the Winnecke System. Therefore a percentage of 3% was used to inform the broad scale estimate (9% of 35%).

5.1.1 Sandstone Outcrops



Plate 1. Sandstone Outcrop Habitat

This habitat 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 mostly soft spinifex (*Triodia* sp.)

Areas at lower elevations are comprised mostly of highly weathered sandstone pebbles/gravels (mapped as the Rocky Plains Habitat), or residual sands (mapped as Sandy Plains habitat type).

Substrate in this habitat consists almost entirely of sandstone rock outcrop with skeletal soils.

5.1.2 Rocky Plains



Plate 2. Rocky Plains Habitat

The Rocky Plains habitat is generally comprised of very sparse overstorey of Eucalypts over scattered *Acacia* midstorey (typically *Acacia coleii*) over an understorey dominated by *Triodea spp.*. Substrate is comprised mostly of quartzite and/or sandstone, in varied states of weathering, sometimes with a shallow layer of sand (at lower elevations, or in interface with Sandy Plains). Areas where the substrate was intact is mapped as the Sandstone Outcrop habitat.

The Rocky Plains habitat was also found in isolated 'pockets' within the Inverway Land System, which mainly consists of dark cracking clays. These islands 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.

In most of the Development Envelope, this habitat type is related to the Winnecke System Unit 1 (low linear or rounded hills). Areas at higher elevations within this unit typically had substrate that was more intact than this habitat type).

5.1.3 Black Soil Plains



Plate 3. Black Soil Plains Habitat

Extensive plains of self-mulching cracking clays (black soil), generally treeless with an understorey of tussock grasses (mainly *Chrysopogon sp.*). In areas of disturbance, some midstorey species are prevalent, generally *Vachellia farnesiana* and *Calotropis procera*.

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 habitat type is closely aligned with the Inverway System. No other Land Systems were found to contain this habitat type. In some areas, expressions of the Rocky Plains habitat type is evident. This is likely due to the Black Soil Plains overlaying other geological strata associated with adjacent Land Systems.

5.1.4 Drainage Lines



Plate 4: Drainage Line Habitat

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 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.

5.1.5 Lateritic Plains



Plate 5. Lateritic Plains Habitat

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

5.1.6 Sandy Plains



Plate 6. Sandy Plains Habitat

This habitat 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 have red or yellow-red sands.

A small portion of the Inverway System was found to contain this habitat type (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 a surface expression of the Winnecke System, which could extend under the Sturt Creek System and into the Inverway System. This habitat type adjoins the Saline Plains habitat and Rocky Plains.

5.1.7 Saline Plains



Plate 7. Saline Plains Habitat

This habitat type typically occupies a small portion of low-lying areas within valleys of the Winnecke Land System, typically adjacent to Sandy Plains habitats (Units 2 and 3 – gently sloping sandplains or valley floors). Approximately 9% of the landforms associated with Units 2 and 3 was this habitat type. This habitat is generally minimally vegetated, dominated by tussock grasses and samphires (*Tecticornia* spp).

This habitat type displayed evaporated surface salt deposits. It is possible that this unit occurs where there is an upwelling of mineral rich groundwater from nearby sandstone hills and outcrops. Accordingly, this habitat type was found to be relatively uncommon within the Development Envelope.

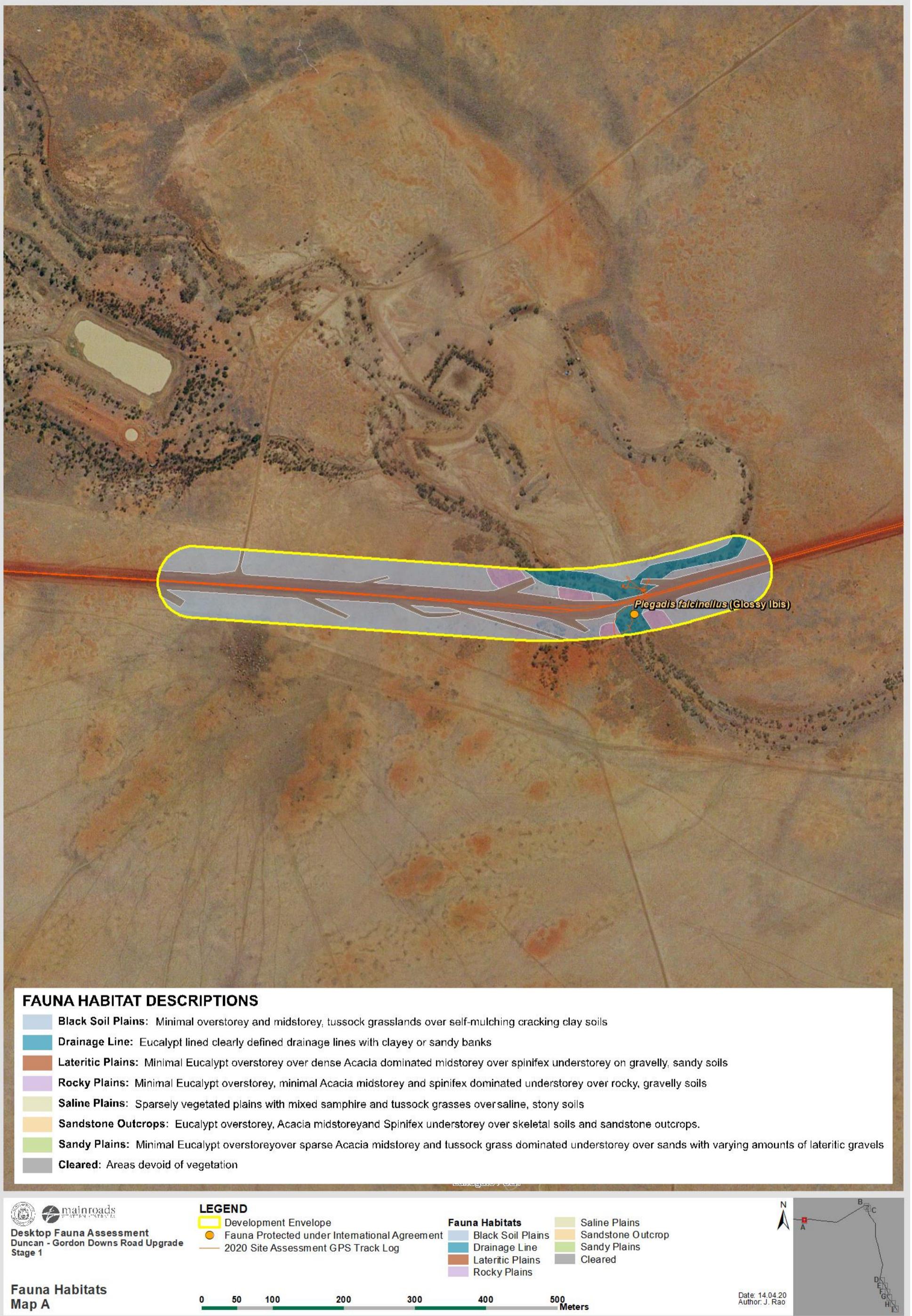


Figure 5A. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

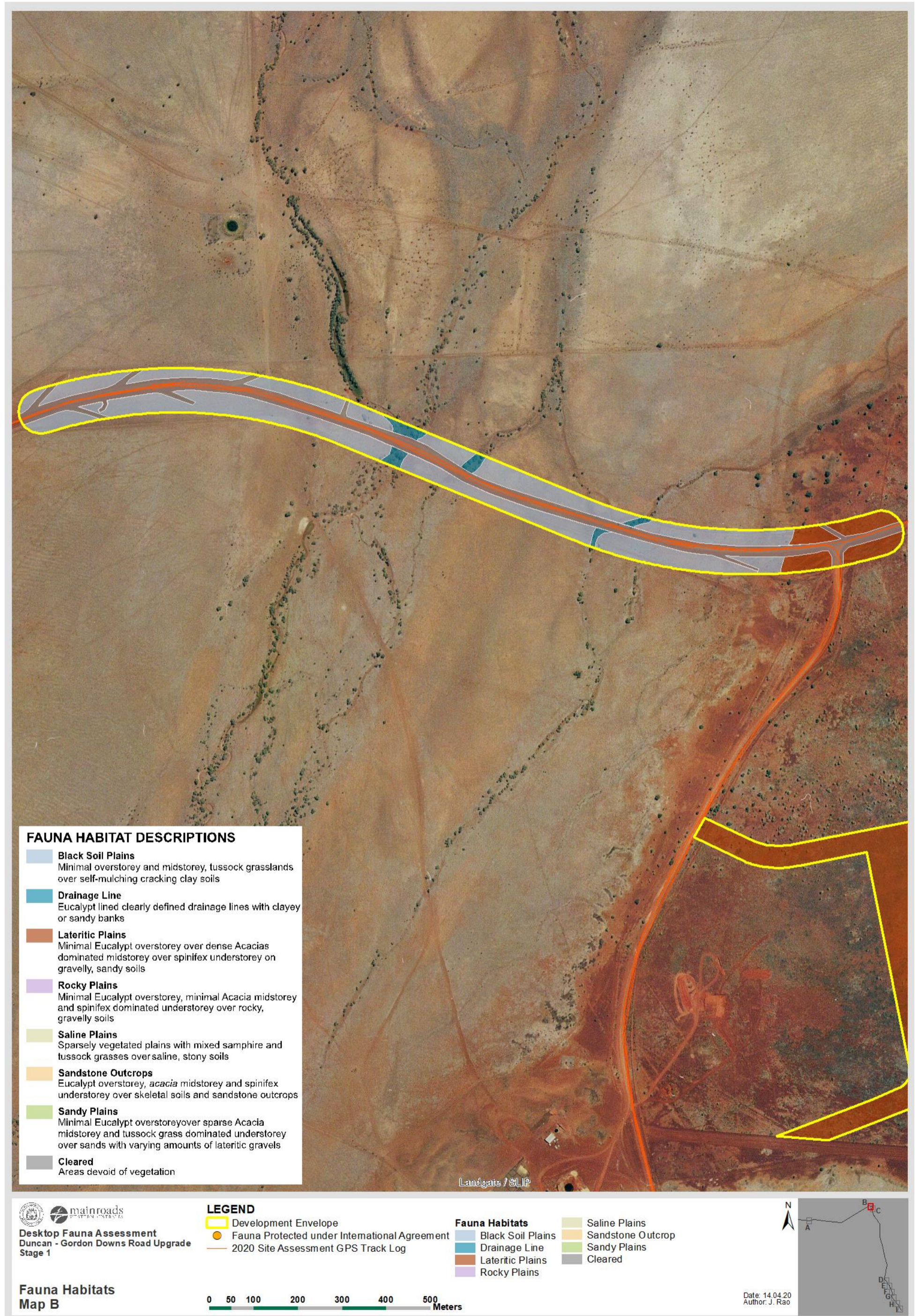


Figure 5B. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

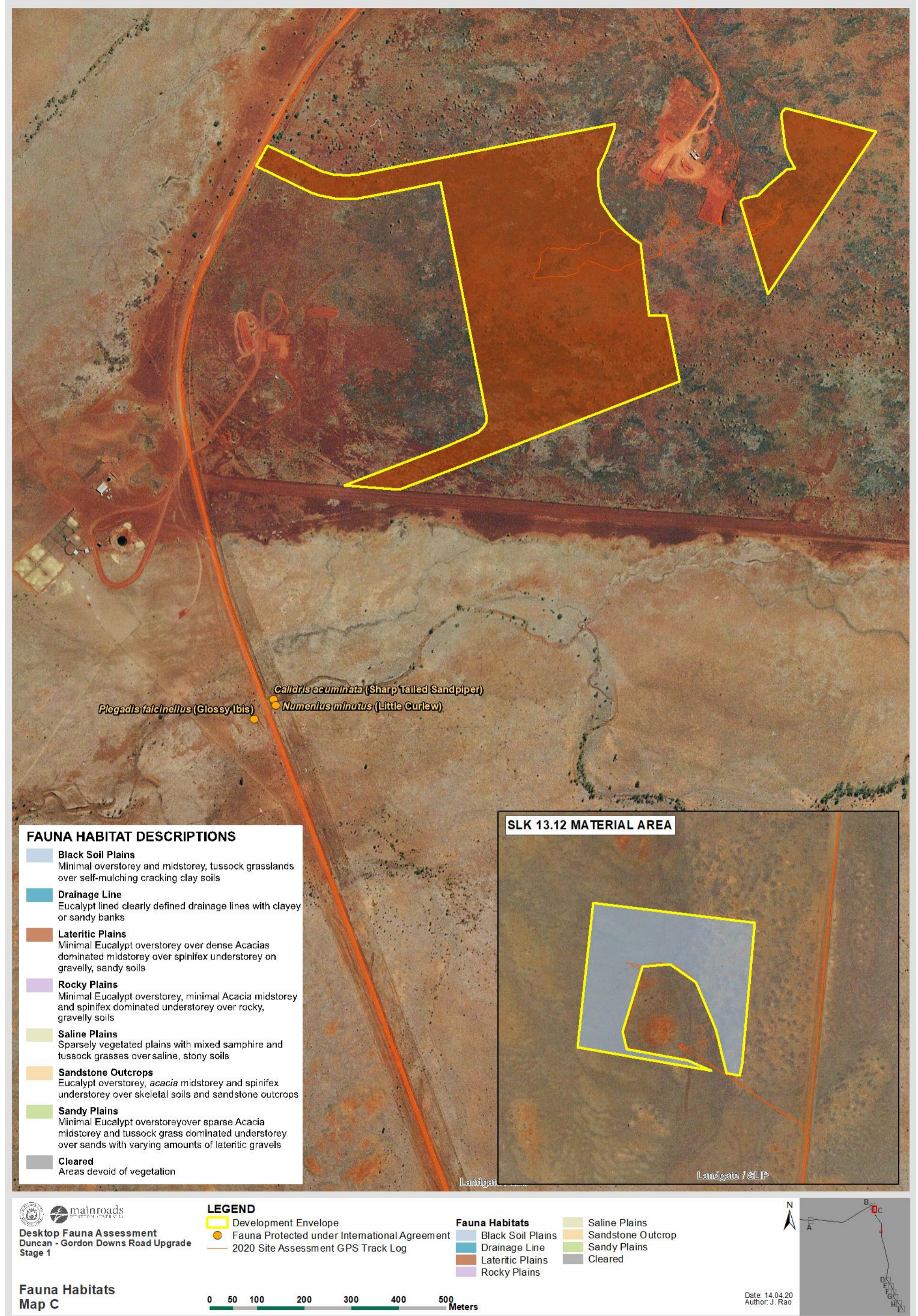


Figure 5C. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

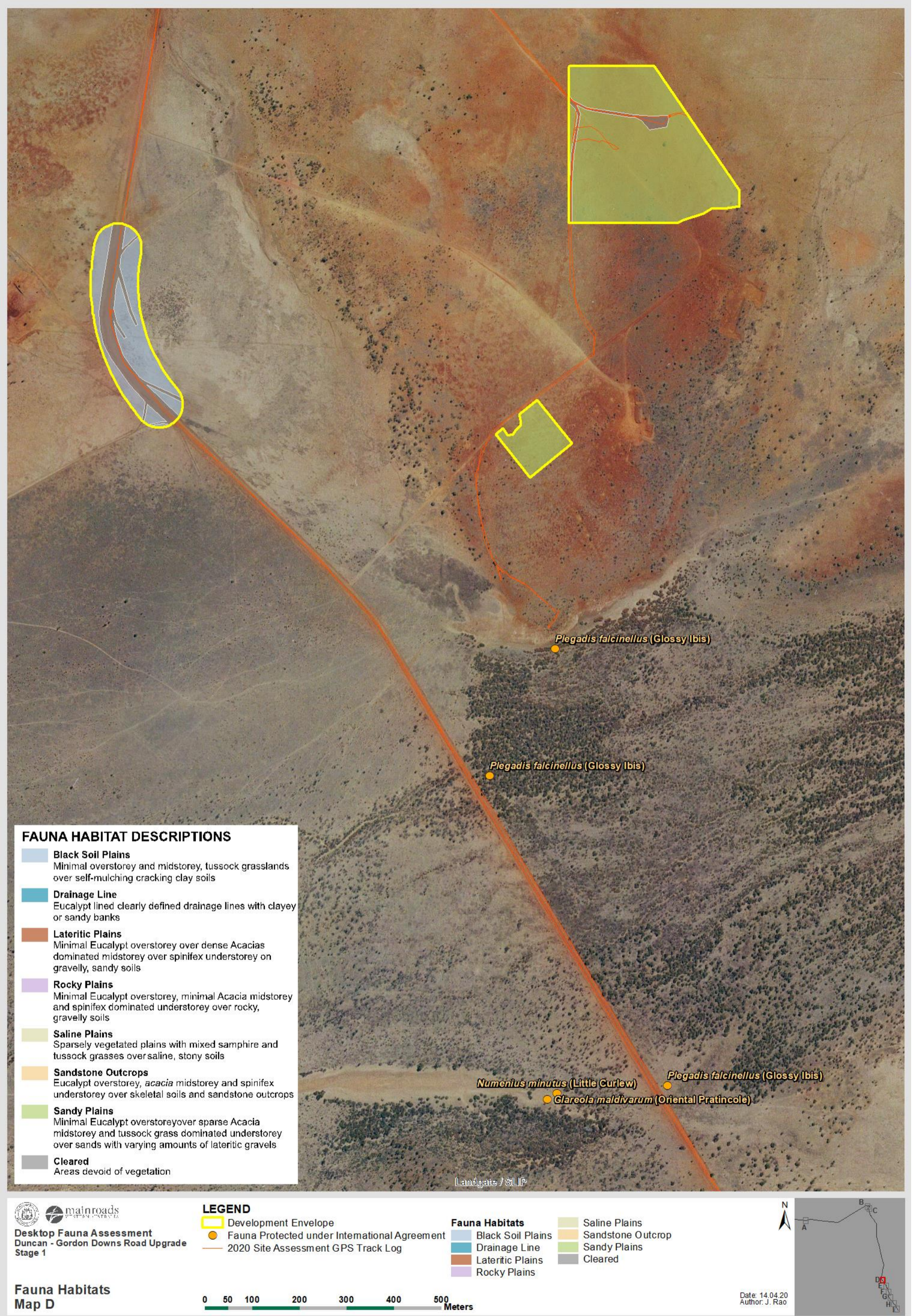


Figure 5D. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

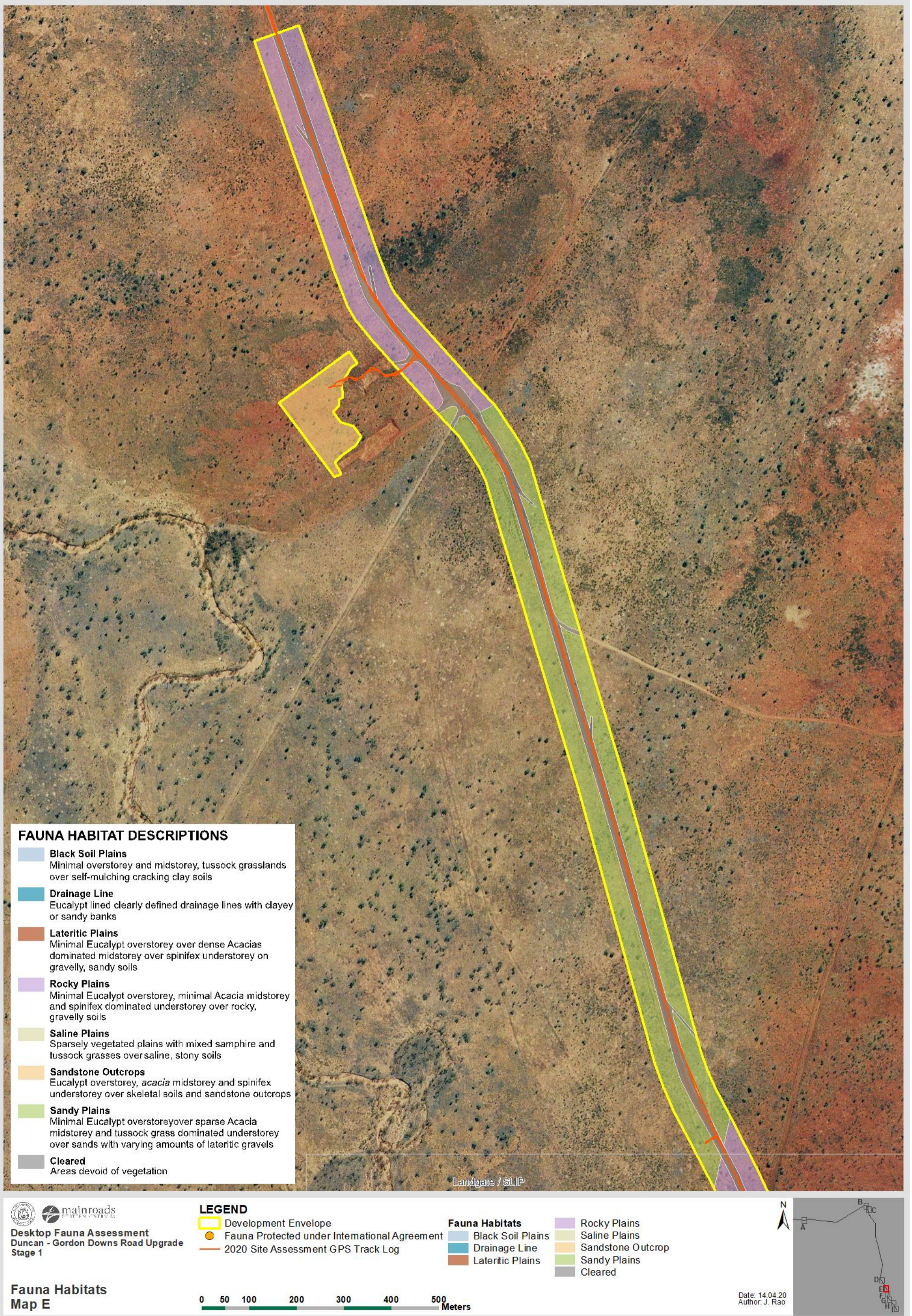


Figure 5E. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

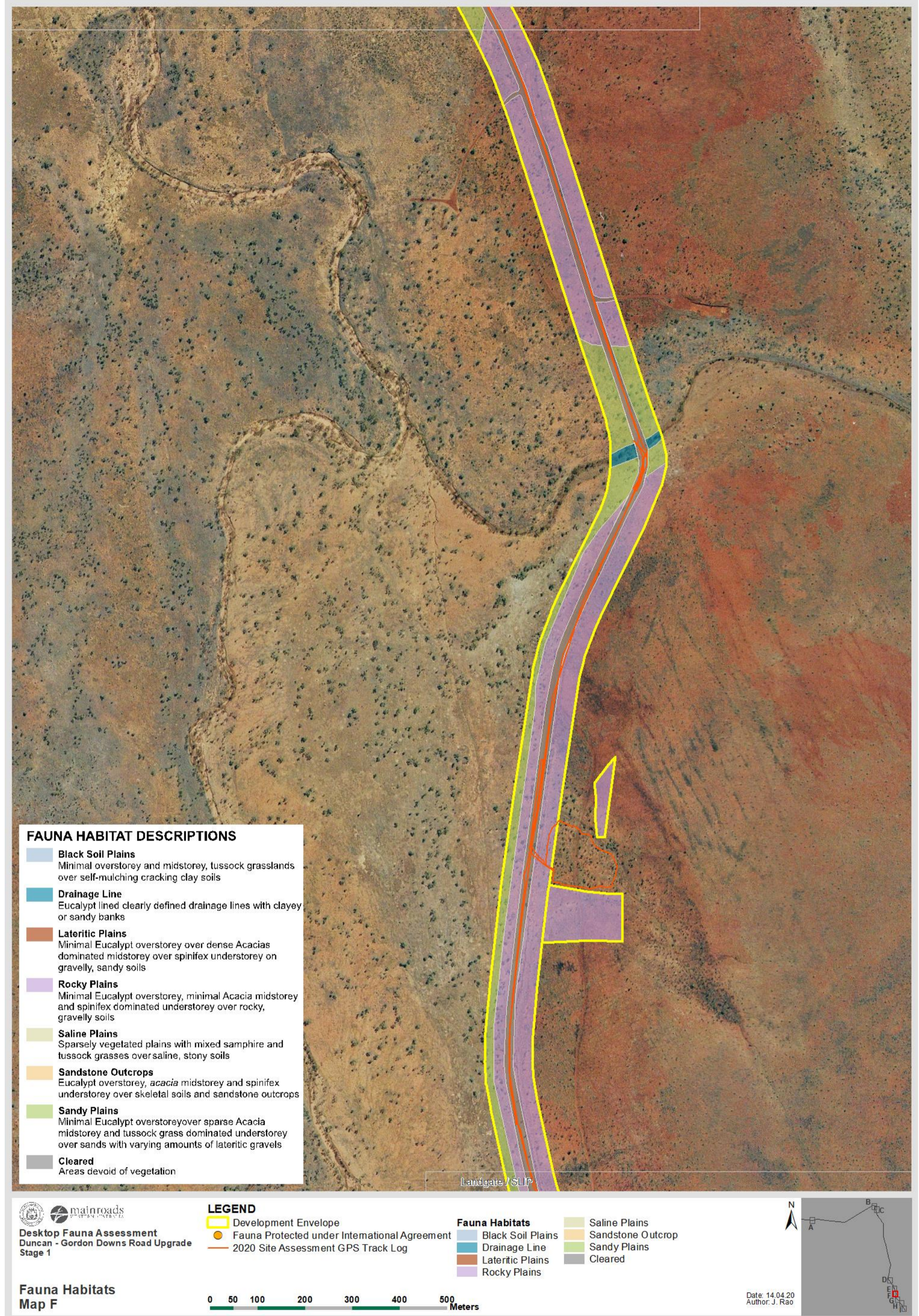


Figure 5F. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

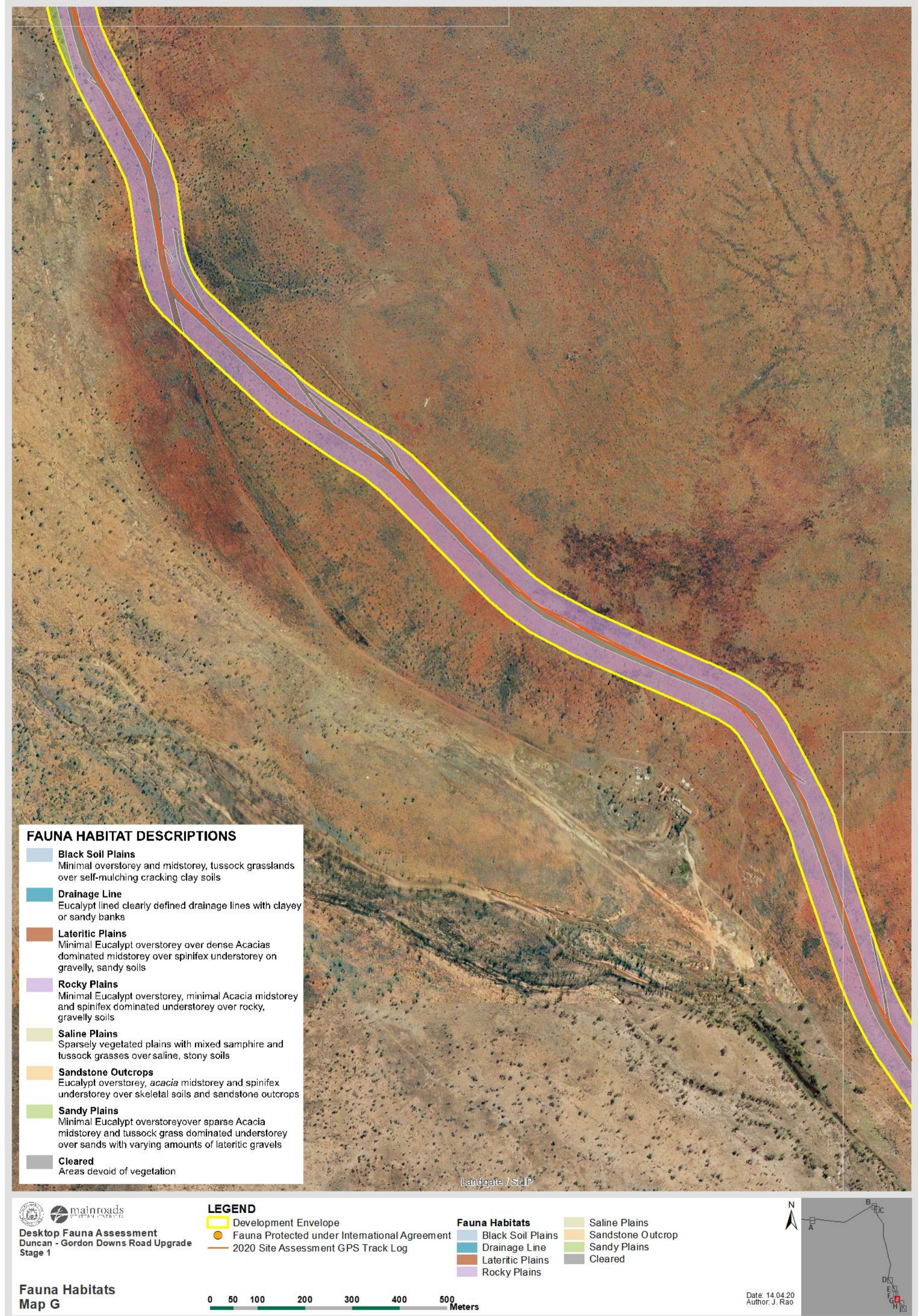


Figure 5G. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

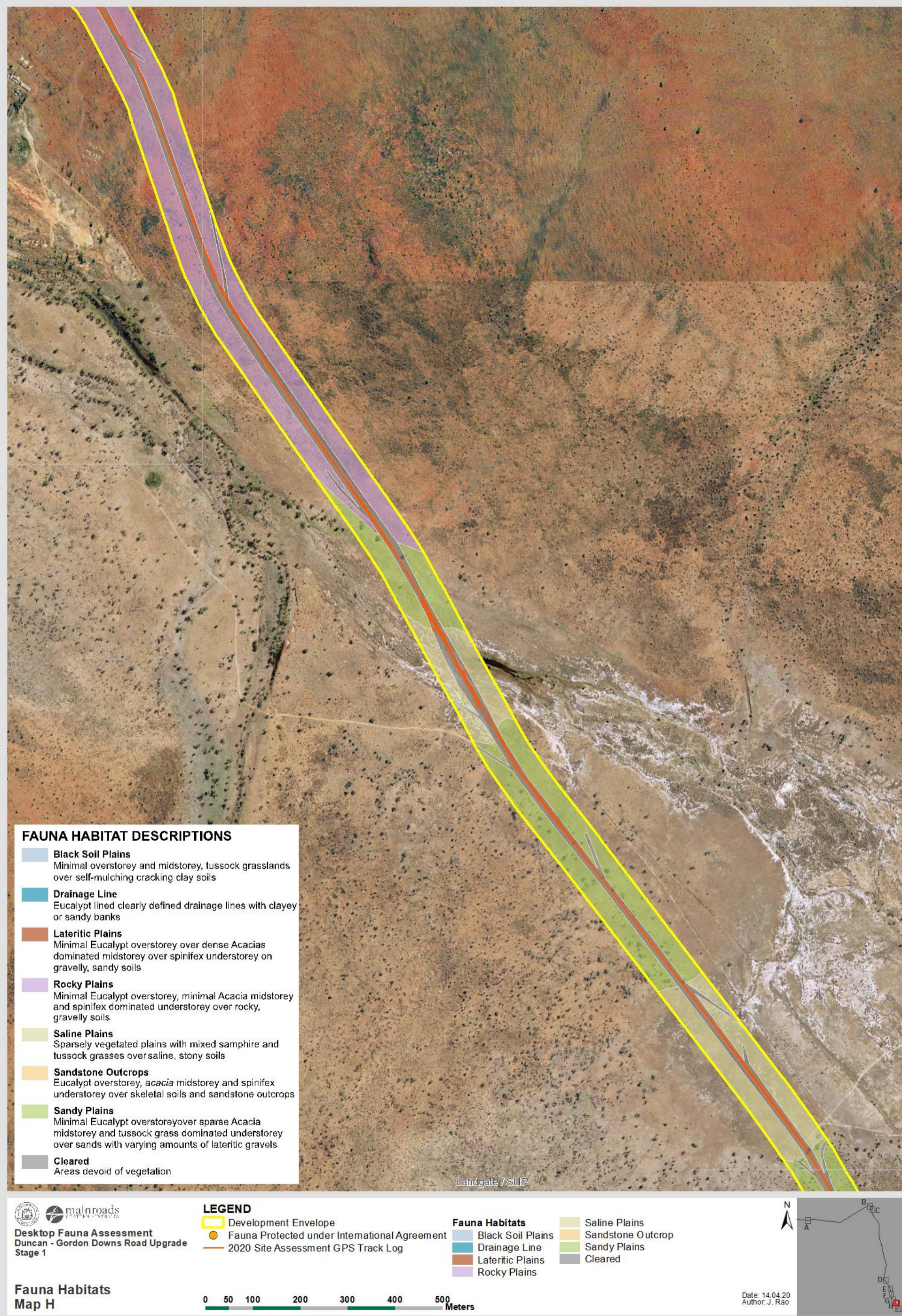


Figure 5H. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

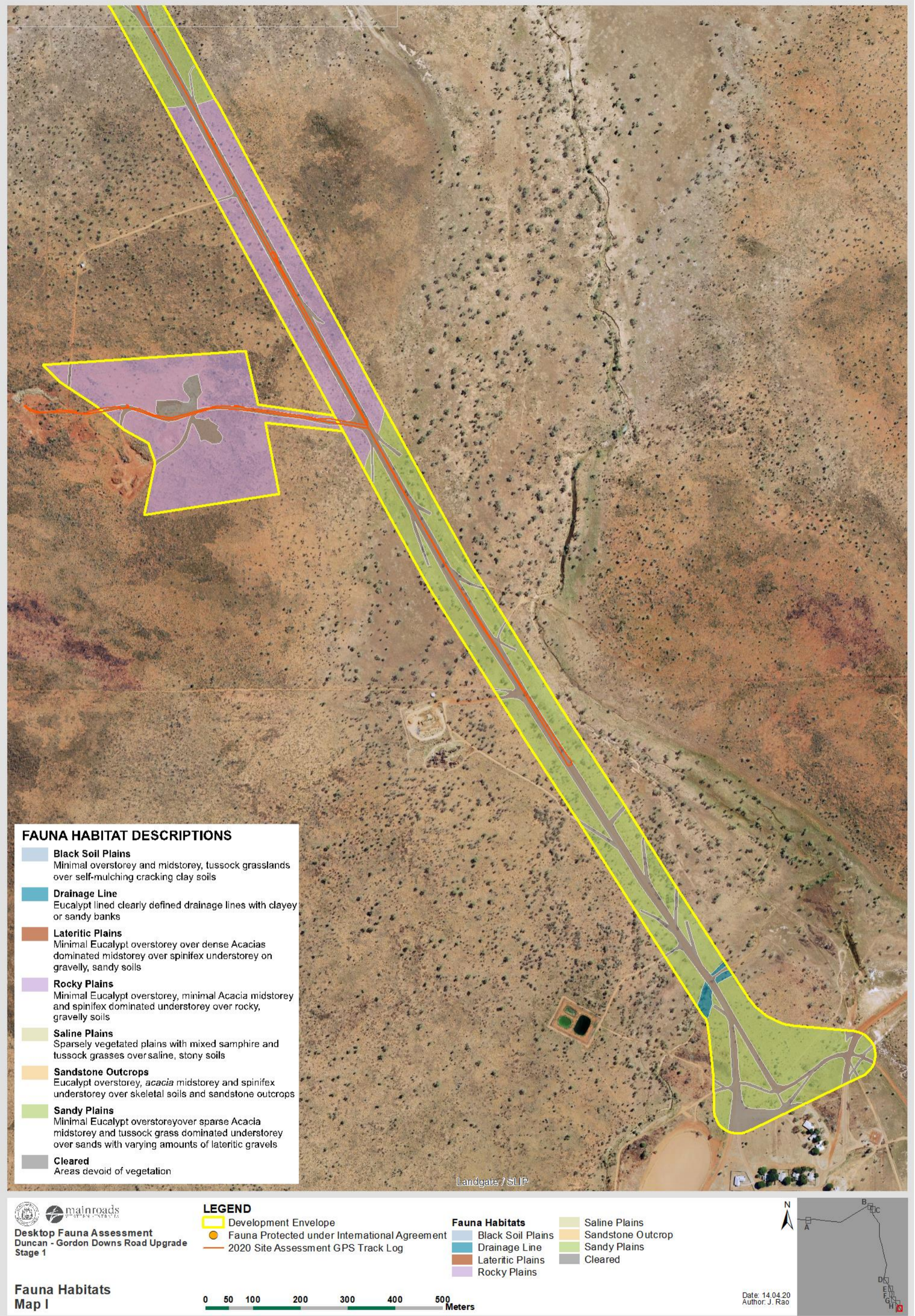


Figure 51. Fauna Habitats and Conservation Significant Fauna (MRWA 2020)

6 FAUNA RECORDS

6.1 Database Search Results

A search of DBCA (Threatened Fauna Database at a 50km buffer and NatureMap at 40km buffer) and DAWE databases (Protected Matters Search Tool at a 50km buffer) identified the following State listed conservation significant fauna species:

Rare or Threatened Fauna

- Australian Painted Snipe (*Rostralluta australis*)
- Curlew Sandpiper (*Calidris ferruginea*)
- Ghost Bat (*Macroderma gigas*)
- Greater Bilby (*Macrotis lagotis*)
- Grey Falcon (*Falco hypoleucos*)
- Night Parrot (*Pezoporus occidentalis*)
- Purple-crowned Fairy-wren (*Malurus coronatus* subsp. *coronatus*)
- Red Goshawk (*Erythrotriorchis radiates*)
- Red Knot (*Calidris canutus*)

Specially Protected (Protected under International Agreement)

- Barn Swallow (*Hirundo rustica*)
- Caspian Tern (*Hydroprogne caspia*)
- Common Greenshank (*Tringa nebularia*)
- Common Sandpiper (*Actitis hypoleucos*)
- Curlew Sandpiper (*Calidris ferruginea*)
- Fork-tailed Swift (*Apus pacificus*)
- Glossy Ibis (*Plegadis falcinellus*)
- Grey Wagtail (*Motacilla cinerea*)
- Gull-billed Tern (*Gelochelidon nilotica*)
- Little Curlew (*Numenius minutus*)
- Oriental Plover (*Charadrius veredus*)
- Oriental Pratincole (*Glareola maldivarum*)
- Osprey (*Pandion cristatus* / *Pandion haliaetus*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Red-necked Stint (*Calidris ruficollis*)
- Sanderling (*Calidris alba*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Swinhoe's Snipe (*Gallinago megala*)
- Wood Sandpiper (*Tringa glareola*)
- Yellow Wagtail (*Motacilla flava*)

Other Specially Protected

- Freshwater Crocodile (*Crocodylus johnstoni*)
- Peregrine Falcon (*Falco peregrinus*)

Priority 1 DBCA

- Gravel Dragon (*Cryptagama aurita*)

Priority 2 DBCA

- Yellow-lipped Cave Bat (*Vespadelus douglasorum*)

Priority 4 DBCA

- Gouldian Finch (*Erythrura gouldiae*)
- Lakeland Downs Mouse (*Leggadina lakedownensis*)
- Princess Parrot (*Polytelis alexandrae*)
- Spectacled Hare-wallaby (*Lagorchestes conspicillatus subsp. Leichardti*)

A previous survey conducted by Outback Ecology (2014b; 2014c) for the souther portion of the Development Envelope did not identify any other State listed fauna Locations of historical and current records are provided in Figure 3.

6.2 Site Assessment Results

The Region's Environment Officer (JJ Rao) carried out the Site Assessment across two days: 1 April 2020 – 2 April 2020. A targeted Bilby survey was carried out between 13-14 March 2020 by Dr Richard Southgate and John Silver (Main Roads Kimberley Project Environment Officer). All work areas were visited by vehicle and on foot, apart from a 500m exclusion area around the Ringer Soak Community due to health concerns at the time (GPS track-logs are illustrated in the Figure 5 series). Apart from habitat characterisation (the results of which are described in Section 4.3), opportunistic observations of fauna were undertaken.

A total of 50 species of vertebrate fauna were recorded either within the Development Envelope and wider Desktop Assessment Area (within similar habitats). These comprised 41 birds, seven mammals and two reptiles. A full list of species and habitats they were recorded within is provided in Appendix 3. Identification was assisted using field guides, online resources and professional advice where necessary (ALA 2020; Broome Bird Observatory 2020; Slater et al. 2003; Triggs 2004; Moore 2005; Southgate 2020).

6.2.1 Significant Fauna

One significant species, the Glossy Ibis, was recorded within the Development Envelope. This species is listed as a Migratory species *under Environmental Protection* and as Specially Protected (Migratory) under the *Biodiversity Conservation Act 1999*

- Glossy Ibis

Three other significant species were recorded in adjacent areas of similar habitat within the Desktop Assessment area:

- Oriental Pratincole;
- Little Curlew; and
- Sharp-tailed Sandpiper.

All three bird species are also listed as Migratory species under the *Environment Protection and Biodiversity Conservation Act 1999* and as Specially Protected (Migratory) under the *Biodiversity Conservation Act 2016*.



Plate 8. Glossy Ibis recorded in Drainage Line habitat within the Desktop Assessment Area (Sturt Creek)



Plate 9. Oriental Pratincole recorded in Drainage Line habitat within the Desktop Assessment Area (Sturt Creek)



Plate 10. Little Curlew recorded in recorded in Drainage Line habitat within the Desktop Assessment Area (Sturt Creek)



Plate 11. Sharp-tailed sandpiper recorded in Drainage Line habitat at APPROSLK 10

6.2.2 Introduced Fauna

Four species of introduced fauna were either sighted or recorded from tracks within the Development Envelope, or within similar habitats in the Desktop Assessment Area:

- Cattle (*Bos taurus* / *Bos indicus*);
- Dingo / Wild Dog (*Canis familiaris dingo*);
- Feral Cat (*Felis catus*); and
- Wild Horse (*Equus caballus*).

All apart from Cattle and Horses were recorded from tracks (Plates 13 – 14).



Plate 12. Cattle were frequently recorded throughout the entire Development Envelope, especially in the Black Soil Plains Habitat



Plate 13. Feral cat tracks recorded surrounding standing water in existing gravel pit at SLK 0.74 on the Gordon Downs Road.



Plate 14. Dog / Dingo tracks recorded surrounding standing water in existing gravel pit at SLK 0.74 on the Gordon Downs Road.

7 LIKELIHOOD OF OCCURENCE

Table 6 presents a likelihood of occurrence for all significant 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 habitats to those present in the Development Envelope, either during the site assessment or in previous surveys.

Distribution mapping contains modelled distributions from the DAWE SNES database, as well as spatially validated records from the ALA. In general:

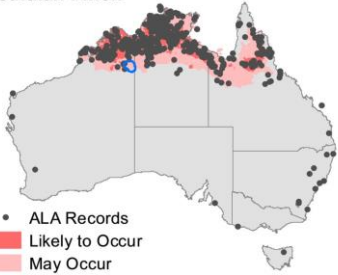
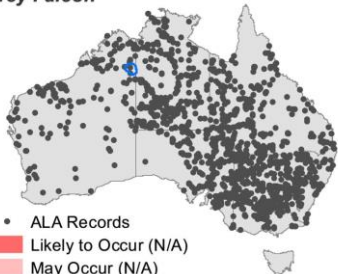
- **Unlikely to Occur:** No suitable habitat within Development Area;
- **May Occur:** Some suitable habitat, but no known records within 50km of Development Envelope, or species occurs in low densities across large areas;
- **Likely to Occur:** Suitable habitat exists in Development Envelope, and species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


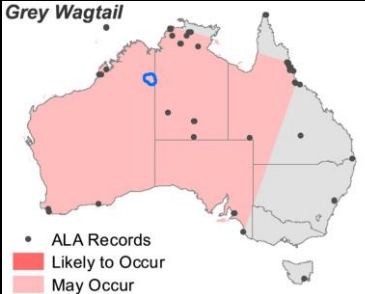
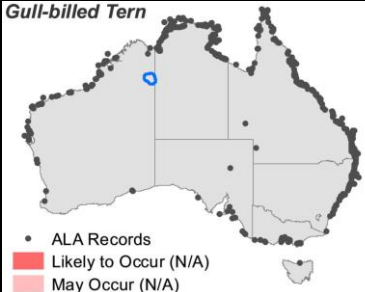
Table 6. Likelihood of Occurrence

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
BIRDS					
Australian Painted Snipe <i>Rostralluta australis</i>	Endangered	No Records	<p><i>Australian Painted Snipe</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May occur in Development Envelope	<p>Habitat Preference Generally occupies shallow terrestrial wetlands, waterlogged grassland or saltmarsh, with rank tussocks of grass, rushes or reeds, samphire and sometimes paperbarks or tree-lined areas (DAWE 2020b).</p> <p>Habitat Availability in Development Envelope Suitable habitat in Development Envelope includes the Black Soil Plains, Drainage Line and Saline Plains habitat when inundated.</p> <p>Although the Australian painted snipe may occur, it is a widespread species across northern and eastern Australia and is dependent upon seasonal water. Habitat within the Development Envelope is likely to be the same or of lesser quality than the surrounding region.</p>
Barn Swallow <i>Hirundo rustica</i>	Migratory	No Records	<p><i>Barn Swallow</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May occur in Development Envelope	<p>Habitat Preference Prefers open country with water or low moist green vegetation. Generally prefers areas with artificial structures for nesting or perching (DAWE 2020b).</p> <p>Habitat Availability in Development Envelope Suitable habitat may include the Black Soil Plains and Sandy Plains habitat types, but could occur across the whole Development Envelope. Apart from fences, there are no artificial structures likely to be used in the Development Envelope. Although the Barn swallow may occur it is a widespread species across northern Australia and is dependent upon seasonal water. Habitat within the Development Envelope is likely to be the same or of lesser quality than the surrounding region.</p>
Caspian Tern <i>Hydroprogne caspia</i>	Migratory	Recorded in adjacent Sturt Creek System (DBCA 2020b)	<p><i>Caspian Tern</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Unlikely to occur in Development Envelope	<p>Habitat Requirements Mostly found in sheltered coastal embayments, but can also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes, waterholes, reservoirs, rivers and creeks.</p> <p>Habitat Availability in Development Envelope The Drainage Line habitat type is likely to be most suitable for this species. There is 1.9 ha of this habitat type within the Development Envelope.</p> <p>Although the Caspian Tern may occur it is a widespread species predominately of coastal environments. It may venture inland but it is unlikely to occur within the Development Envelope.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Common Greenshank <i>Tringa nebularia</i>	Migratory	Recorded in Geebee and adjacent Sturt Creek System (ALA 2020; DBCA 2020b)		Likely to occur in Development Envelope	<p>Habitat Requirements Typically found in a variety of inland wetlands and sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Both permanent and ephemeral terrestrial wetlands are used, including swamps, lakes dams, rivers, inundated floodplains, claypans and saltflats (DAWE 2020b).</p> <p>Habitat in Development Envelope Some habitat in the Development Envelope may be suitable for the species at certain times of the year, including the Black Soil Plains, Drainage Line and Saline Plains habitats (total of 34.3 ha).</p> <p>, Although the Caspian Tern is likely to frequent the Development Envelope following rainfall, it has a wide distribution and the large extent of available habitat outside the Development Envelope is as good if not better than the habitat within the Development Envelope.</p>
Common Sandpiper <i>Actitis hypoleucos</i>	Migratory	Recorded in Geebee and adjacent Sturt Creek System (DBCA 2020b)		May occur in Development Envelope	<p>Habitat Requirements DAWE lists habitat as a wide range of coastal wetlands, and some inland wetlands with varying levels of salinity. The species is mostly found around muddy margins or rocky shores; muddy margins are often narrow and may be steep (DAWE 2020b).</p> <p>Habitat in Development Envelope The Development Envelope does not contain narrow or steep muddy margins to wetland habitats. However, the species may infrequently use the Black Soil Plains and Drainage Line habitats, the interface of which may potentially be suitable (29 ha within the Development Envelope, although suitable areas are likely to be significantly less). The species has been recorded in adjacent land systems with some similar habitat.</p> <p>Although the Common Sandpiper may frequent the Development Envelope following rainfall, it has a wide distribution and the large extent of available habitat outside the Development Envelope is as good if not better than the habitat within the Development Envelope.</p>

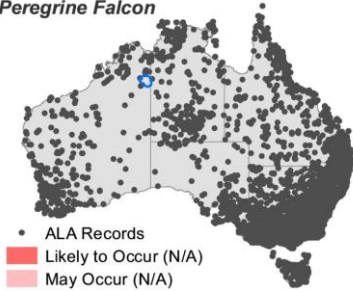
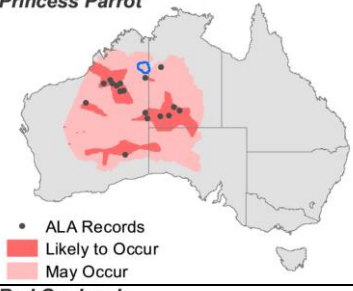
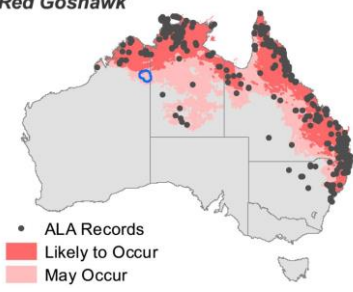
Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Curlew Sandpiper <i>Calidris ferruginea</i>	Critically Endangered	No Records		May occur in Development Envelope	<p>Habitat Requirements This species mainly occurs on intertidal mudflats in sheltered coastal areas, and occasionally inland around ephemeral and permanent water bodies, usually with bare edges of mud or sand (DAWE 2020b).</p> <p>Habitat in Development Envelope Although not considered preferred habitat, some potential habitat includes the Black Soil Plains, Drainage Line and Saline Plains habitats (34.3 ha). Although the Curlew Sandpiper may visit the Development Envelope following rainfall, it has a wide distribution predominately on the coast and the large extent of available habitat outside the Development Envelope is as good if not better than the habitat within the Development Envelope.</p>
Fork-tailed Swift <i>Apus pacificus</i>	Migratory	Recorded in adjacent Sturt Creek System (DBCA 2020b)		May occur in Development Envelope	<p>Habitat Requirements Habitat requirements for this species is extremely broad; inland plains but sometimes in coastal areas. They may occur over dry or open habitats, riparian woodland, melaleuca swamps, scrub, heath or saltmarsh (DAWE 2020b). Accordingly, its distribution modelling is equally broad (DoEE 2018). It is worth noting that this species is almost exclusively aerial, and does not breed in Australia.</p> <p>Habitat in Development Envelope Suitable habitat could be considered as all habitats in the entire Development Envelope (189.3 ha).</p> <p>Although the Caspian Tern is likely to frequent the Development Envelope following rainfall, it has a wide distribution and the large extent of available habitat outside the Development Envelope is as good if not better than the habitat within the Development Envelope.</p>
Glossy Ibis <i>Plegadis falcinellus</i>	Migratory	Recorded in Geebee, Sturt Creek and Antrim System (DBCA 2020b)		Confirmed to occur in Development Envelope	<p>Habitat Requirements Preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains and other water sources.</p> <p>Habitat in Development Envelope Suitable habitat includes the Black Soil Plains at certain times, Drainage Lines and potentially the Saline Plains habitat (34.3 ha in total). The species was recorded within the Black Soil Plains and Drainage Line habitats during the field assessment (MRWA 2020).</p> <p>Despite being recorded within the Development Envelope, habitats outside the Development Envelope are the same if not better quality than within the</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
					Development Envelope. As a migratory species, habitat is not significant within the Development Envelope.
Gouldian Finch <i>Erythrura gouldiae</i>	Priority 4	Recorded in Franklin System (DBCA 2020b)	<p><i>Gouldian Finch</i></p> 	May occur in Development Envelope	<p>Habitat Requirements Species occurs in open woodlands dominated by Eucalyptus trees and a ground cover of sorghum and other grasses as well as surface water (DAWE 2020b). This is a very common environment in the top end of Australia, and is supported by distribution mapping (DoEE 2018). The Project is located on the margins of core habitat as the desert country to the south of the Project Area is not thought to be suitable.</p> <p>Habitat in Development Envelope Habitat in the Development Envelope could be considered to be Drainage Lines, some areas of Rocky Plains and Sandy Plains habitats (122.7 ha). However as the Development Envelope is at the southern end of the known range, habitat that may occur within the Development Envelope does not provide significant habitat for the species.</p>
Grey Falcon <i>Falco hypoleucos</i>	Vulnerable	Recorded in Inverway, Sturt and Coolindie System (ALA 2020; DBCA 2020b)	<p><i>Grey Falcon</i></p> 	Likely to Occur in Development Envelope	<p>Habitat Requirements Occurs at low densities across inland Australia. Frequents timbered lowland plains, particularly acacia shrubland that are crossed by tree lined watercourses. It has also been observed hunting in treeless areas such as tussock grassland as well as open woodland (DAWE 2019). These are common habitat types, reflected in the distribution of known records (ALA 2019).</p> <p>Habitat in Development Envelope The species could occur in all habitat types (230 ha). The Grey Falcon has been historically record in the Black Soil Plains habitat close to the Development Envelope. The likelihood of occurrence is listed as 'may occur' because of the low densities of this species. Habitat surrounding the Development Envelope is considered to be as good as if not better than the Development Envelope.</p>

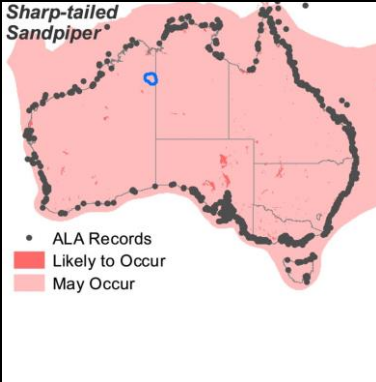
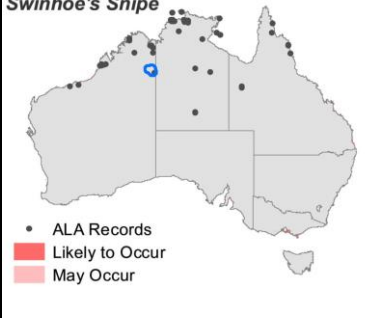
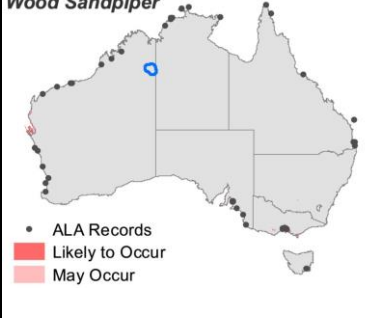
Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Grey-tailed tattler <i>Tringa brevipes</i>	Priority 4	Recorded in Headley System (DBCA 2020b)		Unlikely to Occur in Development Envelope	<p>Habitat Requirements Typical habitat is nearly always in coastal or near-coastal environments. Inland records for this species are rare, with sightings on river banks and edges of rock pools (DAWE 2020b).</p> <p>Habitat in Development Envelope There is no preferred habitat that is likely to be used by this species in the Development Envelope. Species may rarely occur within the Drainage Line habitat (2 ha), however this is unlikely and the species likely has come up in database searches due to widespread bioclimatic modelling.</p>
Grey Wagtail <i>Motacilla cinerea</i>	Migratory	No Records		May Occur in Development Envelope	<p>Habitat Requirements No information on habitat preference was obtained, however, based on known records and modelled distribution, it is likely to be broad.</p> <p>Habitat in Development Envelope Based on distribution mapping and the distribution of records, it is likely that most, if not all habitat within the Development Envelope could be suitable. However extensive suitable habitat occurs through most of western and central Australia and habitat outside of the project area is likely to be as good, if not better, than that within the Development Envelope.</p>
Gull-billed Tern <i>Gelochelidon nilotica</i>	Migratory	Recorded in Sturt Creek System (DBCA 2020b)		Unlikely to Occur in Development Envelope	<p>Habitat Requirements Shallow wetlands, swamps and lagoons, both coastal and sometimes inland (Birdlife Australia 2020).</p> <p>Habitat in Development Envelope Habitat may include Black Soil Plains at certain times and Drainage Lines (total of 29 ha). Although there may be available habitat, it is unlikely to occur within the Development Envelope given that the Gull-billed Tern favours coastal environments and there are no previous records nearby.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Little Curlew <i>Numenius minutus</i>	Migratory	Individuals were found within the Desktop Assessment Area (MRWA 2020)	<p><i>Little Curlew</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Likely to occur in Development Envelope	<p>Habitat Requirements Most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains which have scattered, shallow freshwater pools or are seasonally inundated.</p> <p>Habitat in Development Envelope The Black Soil Plains and Drainage Line habitat is considered suitable habitat (29 ha in total).</p>
Night Parrot <i>Pezoporus occidentalis</i>	Critically Endangered	No Records	<p><i>Night Parrot</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May Occur in Development Envelope	<p>Habitat Requirements Habitat is thought to be broad; spinifex grasslands and/or chenopod shrublands (Threatened Species Scientific Committee 2016a)</p> <p>Habitat in Development Envelope As a conservative estimate, the Lateritic, Rocky, Saline Plains and Sandstone Outcrops may be suitable (107 ha in total). This species is thought to have a broad range throughout inland Australia, as habitat preference is for very common habitats.</p>
Oriental Plover <i>Charadrius veredus</i>	Migratory	Recorded within 50km within Geebee and adjacent Sturt Creek Systems	<p><i>Oriental Plover</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May Occur in Development Envelope	<p>Habitat Requirements Initially spending time in coastal areas before moving inland into flat, open semi-arid or arid grasslands where grass is short and sparse and interspersed with hard bare ground, or open areas that have been recently burnt (DAWE 2020b)</p> <p>Habitat in Development Envelope The Black Soil Plains habitat may be suitable at certain times of the year (27 ha in total). Species has been recorded in adjacent Sturt Creek System.</p> <p>Given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope, habitat within the Development Envelope is not considered significant for this species.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Oriental Pratincole <i>Glareola maldivarum</i>	Migratory	Individuals were observed within the Desktop Assessment Area (MRWA 2020)		Likely to Occur in Development Envelope	<p>Habitat Requirements Usually inhabits open plains, floodplains or short grasslands often with extensive bare areas. Often occur near terrestrial wetlands (DAWE 2020b)</p> <p>Habitat in Development Envelope The Black Soil Plains, Drainage Line and Saline Plains habitats are suitable (34.3 ha in total). Species was recorded within the Sturt Creek Land System during the field assessment (MRWA 2020) and therefore potential to visit habitats nearby within the Development Envelope. Preferred habitat is common throughout northern Australia however given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope Habitat within the Development Envelope is not considered significant for this species.</p>
Osprey <i>Pandion cristatus</i>	Migratory	No Records		Unlikely to Occur in Development Envelope	<p>Habitat Requirements Mostly occur in littoral and coastal habitat but occasionally travel inland along major rivers. Extensive areas of open fresh, brackish or saline water is required for foraging (DAWE 2020b)</p> <p>Habitat in Development Envelope The species may occur within the Sturt Creek Land System, however the Development Habitat does not contain suitable habitat (extensive areas of open water).</p>
Pectoral Sandpiper <i>Calidris melanotos</i>	Migratory	Not recorded within 50km		May Occur in Development Envelope	<p>Habitat Requirements Habitat listed as shallow fresh to saline wetlands, including inundated grasslands, saltmarshes, river pools, creeks, floodplains (DAWE 2020b).</p> <p>Habitat in Development Envelope The Black Soil Plains, Drainage Line and Saline Plains habitats may provide suitable habitat for the species (34.3 ha in total). Preferred habitat is common throughout northern Australia however given the availability of large areas of habitat outside the Development Envelope habitats within the Development Envelope are not considered significant for the species given it is migratory and dependence upon available water.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Peregrine Falcon <i>Falco peregrinus</i>	Other Specially Protected	No Records	Peregrine Falcon 	Likely to occur in Development Envelope	Habitat Requirements Found in most habitats across Australia, and is reflected in the distribution mapping. Open woodland is required for nesting (ALA 2019; Birdlife Australia 2020). Habitat in Development Envelope All habitat types may be suitable for this species (189.3 ha in total). Given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope, habitat within the Development Envelope is not considered significant for this species.
Princess Parrot <i>Polytelis alexandrae</i>	Priority 4	No Records	Princess Parrot 	Unlikely to Occur within Development Envelope	Habitat Requirements Habitat is sand dunes and sand flats in the arid zone. Occurs in open savanna woodland consisting of eucalypt overstorey, acacia midstorey and groundcover dominated by Triodia sp. (DAWE 2020b). Habitat in Development Envelope No habitats in the Development Envelope matches the requirements of the species.
Red Goshawk <i>Erythrotriorchis radiatus</i>	Vulnerable	No historical records within 50km	Red Goshawk 	May Occur in Development Envelope	Habitat Preference In the Kimberley, the Red Goshawk is known to occupy tall open forest and woodland, or tall fringing woodlands along rivers in grasslands, shrub-lands and low open woodlands (DAWE 2020b). Habitat in Development Envelope Suitable habitat may include some areas of the Drainage Line, Sandstone Outcrop and Sandy Plains habitat types (54.9 ha). Preferred habitat is common throughout northern Australia however given the availability of large areas of habitat outside the Development Envelope habitat within the Development Envelope is not considered significant.

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Red Knot <i>Calidris canutus</i>	Endangered	Detected in the Headley System (ALA 2020; potential coordinate generalisation)	<p><i>Red Knot</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Unlikely to Occur in Development Envelope	<p>Habitat Requirements Mostly coastal habitats, but occasionally seen on terrestrial saline wetlands near the coast. Rarely use inland lakes or swamps (DAWE 2020b)</p> <p>Habitat in Development Envelope There is no habitat for this species in the Development Envelope.</p>
Red-necked Stint <i>Calidris ruficollis</i>	Migratory	Detected in the Headley System (ALA 2020)	<p><i>Red-necked Stint</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Likely to Occur in Development Envelope	<p>Habitat Requirements Found in coastal habitats, but may also occur in saltmarsh, shallow wetlands such as lakes, swamps, riverbanks, flooded paddocks or damp grasslands (Birdlife Australia 2020).</p> <p>Habitat in Development Envelope The Black Soil Plains, Drainage Line and Saline Plains habitats may provide suitable (34.3 ha in total) however the species is predominately found on the coast and has a wide distribution across northern Australia. Therefore habitat within the Development Envelope is not considered significant for the species. .</p>
Sanderling <i>Calidris alba</i>	Migratory	No Records	<p><i>Sanderling</i></p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Unlikely to Occur in Development Envelope	<p>Habitat Requirements Almost always found on the coast, rarely in near coastal wetlands. There are rare inland records from sandy shores of ephemeral brackish lakes and river pools (DAWE 2020b).</p> <p>Habitat in Development Envelope There is no suitable habitat in the Development Envelope.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Sharp-tailed Sandpiper <i>Calidris acuminata</i>	Migratory	Individuals were observed within the Desktop Assessment Area (MRWA 2020)		Likely to Occur in Development Envelope	<p>Habitat Requirements Muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or low vegetation (DAWE 2020b).</p> <p>Habitat in Development Envelope The Black Soil Plains, Drainage Line and Saline Plains habitats are suitable (34.3 ha in total). Species was recorded in similar Drainage Line habitat outside the Development Envelope during the site assessment (MRWA 2020) and is therefore like to be a vagrant visitor of the Development Envelope. Preferred habitat is common throughout northern Australia and given the availability of large areas of habitat outside the Development Envelope Habitat within the Development Envelope is not considered to be significant.</p>
Swinhoe's Snipe <i>Gallinago megala</i>	Migratory	Recorded in Coolindie System (DBCA 2020b)		May Occur in Development Envelope	<p>Habitat Requirements Dense clumps of grass/rushes round the edges of fresh and brackish wetlands, including claypans and inundated plains pitted with crab holes (DAWE 2020b).</p> <p>Habitat in Development Envelope The Black Soil Plains and Drainage Line habitats may provide suitable habitat for the species. (29 ha in total). given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope Habitat within the Development Envelope is not considered significant.</p>
Wood Sandpiper <i>Tringa glareola</i>	Migratory	Recorded in adjacent Sturt Creek and Geebee System		May Occur in Development Envelope	<p>Habitat Requirements Well vegetated, shallow freshwater wetlands, with emergent, aquatic plants or grass, and dominated by taller fringing vegetation. Also frequents inundated grasslands, or floodplains. Rarely found in brackish wetlands or dry stunted saltmarsh (DAWE 2020b).</p> <p>Habitat in Development Envelope The Black Soil Plains and Drainage Line habitats may be suitable at certain times (29 ha in total). given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope Habitat within the Development Envelope is not considered significant.</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Yellow Wagtail <i>Motacilla flava</i>	Migratory	No Records	<p>Yellow Wagtail</p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May occur in the Development Envelope	<p>Habitat Requirements Favours wet meadows, marshland, grassy and muddy lakeshores (eBird Australia 2020).</p> <p>Habitat in Development Envelope The Black Soil Plains habitat may be suitable for the species (27 ha). Given the wide distribution of records and the availability of large areas of habitat outside the Development Envelope potential habitat within the Development Envelope is not considered significant.</p>
MAMMALS					
Ghost Bat <i>Macroderma gigas</i>	Vulnerable	Detected within hilly country to the west of the Project Area	<p>Ghost Bat</p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	Unlikely to occur in Development Envelope	<p>Habitat Requirements Ghost bats are dispersed widely when not roosting. During roosting, occurrences are more concentrated. Roost site includes caves, rock crevices and disused mine shafts (Threatened Species Scientific Committee 2016b)</p> <p>Habitat in Development Envelope There is no suitable habitat in the Development Envelope.</p>
Greater Bilby <i>Macrotis lagotis</i>	Vulnerable	Detected mostly within red sandplains of the Coolindie Land System. One record from the Inverway Sytem.	<p>Greater Bilby</p> <ul style="list-style-type: none"> • ALA Records ■ Likely to Occur ■ May Occur 	May occur in Development Envelope	<p>Habitat Requirements Open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises, and hummock grassland growing on sand plains/dunes, drainage systems, salt lake systems and other alluvial areas (Pavey 2006).</p> <p>Habitat in Development Envelope The Lateritic Plains, Saline Plains and Sandy Plains habitats may be suitable for the species (44.8 ha in total).</p> <p>Expected Impacts According to site assessments carried out by Envisage Environmental, no evidence of the species was found in the Development Envelope, however, there is evidence that the species occurs on sand plain habitat as well as lateritic outcrops (Appendix D).</p>

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Lakeland Downs Mouse <i>Leggadina Lakedownensis</i>	Priority 4	Recorded within the Coolindie System		May Occur in Development Envelope	<p>Habitat Requirements Found in areas of open tussock and areas of open tussock and hummock grassland, acacia shrubland, chenopods, and savannah woodland on alluvial clay or sandy soils (Moro and Kutt 2008).</p> <p>Habitat in Development Envelope The Sandy and Saline Plains habitats may be suitable (58.2 ha)</p> <p>The species is distributed widely over most of northern Australia due its the relatively common habitat preference however given that habitat surrounding the Development Envelope is likely to be in the same or better condition, available habitat within the Development Envelope is not considered significant.</p>
Spectacled Hare-Wallaby <i>Lagorchestes conspicillatus</i> subsp. <i>leichardti</i>	Priority 4	Recorded within Barry and Coolindie System		May Occur in Development Envelope	<p>Habitat Requirements Wide variety of habitat including open forests, open woodland, tall shrublands, tussock grasslands and hummock grasslands (Winter, Woinarsky and Burbidge 2016).</p> <p>Habitat in Development Envelope Given the broad adaptability of the species, the species may occur in all habitat types (189.3 ha) This species is widely distributed throughout northern Australia. There is a high density of records across the WA border in the Northern Territory. This is likely due to sampling bias, and it is considered that the species could be equally distributed on the WA side. However habitat outside the Development Envelope, especially on the eastern side, is likely to be as good, if not better quality for the species, habitat within the Development Envelope is not considered to be significant.</p>
Yellow-lipped Cave Bat <i>Vespadelus douglasorum</i>	Priority 2	Detected within hilly country to the west of the Project Area		Unlikely to occur in Development Envelope	<p>Habitat Requirements Roosts in caves, mainly occurring in woodlands and can be encountered close to waterbodies in sandstone ranges (Armstrong, Burbidge and Woinarsky 2017).</p> <p>Habitat in Development Envelope There is no suitable habitat in the Development Envelope.</p>
REPTILES					

Species	Conservation Status (WA)	Historical Records (<50 km)	Distribution Modelling / Occurrence Map	Likelihood of Occurrence	Justification
Freshwater Crocodile <i>Crocodylus johnstoni</i>	Other Specially Protected	Recorded within 50km in restricted loactions (permanent river pools north of the Project Area)		Unlikely Occur in Development Envelope	<p>Habitat Requirements Occurs in various permanent freshwater environments. During wet seasons, habitats may become inundated, allowing crocodiles to move throughout the floodplains, until levels drop, when they return to their permanent habitat. (Australian Museum 2020).</p> <p>Habitat in Development Envelope There are no permanent freshwater bodies within the Development envelope therefore it is considered unlikely to occur. The Drainage Line and Black Soil Plains habitat may be infrequently used when rainfall is sufficient to flood, although this is not a common occurrence.</p>
Gravel dragon <i>Cryptagama aurita</i>	Priority 1	Recorded in the west within the Dockrell System		May Occur in Development Envelope	<p>Habitat Requirements Little is known about the species, which is known from several isolated populations in the Kimberley and Northern Territory where it occurs in rocky areas with spinifex</p> <p>Habitat in Development Envelope Some areas of the Rocky Plains and Sandstone Outcrop habitat may be suitable totalling 69.8 ha.</p>

8 CONCLUSION

The desktop assessment characterised and mapped the range of fauna habitats present in the Development Envelope. Seven habitat types were mapped, and estimates of their extents within 50km made based on Land System mapping by the Department of Agriculture and Food. All habitat types were found to be common for the area.

The assessment also identified a suite of vertebrate fauna that could have the potential to occur within the site based on habitat requirements and availability within the Development Envelope.

Seven birds are likely to occur and one was confirmed to occur during the April 2020 site assessment. In all cases habitat for these species within the Development Envelope is not considered to be significant given the mobile nature and broad distributions of the species and the availability of habitat in the surrounding area.

Three mammals are likely to occur or may occur: the Bilby, Lakeland Downs Mouse and Spectacled Hare Wallaby. Habitat within the Development Envelope is not considered significant due to the wide distribution of historical records and the large availability of habitat within the surrounding area.

One reptile, the Gravel Dragon was assessed as potentially occurring, however as above, impacts are not expected.

9 REFERENCES

Armstrong, K. Burbidge, A.A. Woinarsky, J. 2017. *Vespadelus douglasorum*. *The IUCN Red List of Threatened Species 2017*. E.T7923122118433. Available at: <https://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T7923A22118433.en>. Accessed 22 April 2020.

Atlas of Living Australia (ALA) 2020. Species Records. Online Database. Available at: <https://www.ala.org.au/>. Accessed: 25/03/2020.

Australian Museum 2020. *Freshwater Crocodile*. Available at: <https://australianmuseum.net.au/learn/animals/reptiles/freshwater-crocodile/>. Accessed: 22/04/2020.

Broome Bird Observatory 2020. Online information and personal communication (Nyil Khwaja – Warden). Birdlife Australia.

Department of Agriculture, Water and the Environment (DAWE) 2020a. *Protected Matters Search Tool (PMST)*. Online Database, Commonwealth of Australia. Available at: <https://www.environment.gov.au/epbc/pmst/>. Accessed: 27/03/2020.

Department of Agriculture, Water and the Environment (DAWE) 2020b. *Species Profiles and Threats (SPRAT)*. Online Database, Commonwealth of Australia. Available at: <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>. Accessed: 15/04/2020.

Department of Biodiversity Conservation and Attractions (DBCA) 2020a. *NatureMap*. Online Database, Government of Western Australia. Available at: <https://naturemap.dbca.wa.gov.au/>. Accessed 23/03/2020.

Department of Biodiversity Conservation and Attractions (DBCA) 2020b. *Threatened Fauna Database*. GIS Database. Government of Western Australia. Received on: 25/03/2020

Department of Energy and Environment (DoEE) 2018. *Species of National Environmental Significance Public Grids (SNES)*. GIS Database. Commonwealth of Australia

eBird Australia 2020. *Western Yellow Wagtail*. Available at: <https://ebird.org/australia/species/eaywaq1/AU-QLD-BRI>. Accessed 22 April 2020.

Envisage Environmental Services 2020. *Report on Bilby Monitoring in association with the Duncan-Gordon Downs Road Upgrade*. Dr. Richard Southgate, Envisage Environmental Services. Prepared for Main Roads Western Australia.

Government of Western Australia 2019. 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2018. Department of Biodiversity, Conservation and Attractions, Perth, Western Australia. Available online from: <https://www2.landgate.wa.gov.au/web/guest/downloader>

Main Roads Western Australia (MRWA) 2020. Duncan-Gordon Downs Road Upgrade Stage 1 Site Assessment. 1 April to 2 April 2020. Results detailed in this report.

Moore, P. 2005. *A Guide to Plants of Inland Australia*. Reed New Holland Publishing.

Moro, D. and Kutt, A.S. 2008. *The Mammals of Australia*. 3rd edn. (eds van Dyck, S and Strahan R). Reed New Holland Publishing.

Outback Ecology 2014a. *Northern Minerals Browns Range Project – Level 2 Vegetation and Flora Survey and Impact Assessment June 2014*. Prepared for Northern Minerals Limited.

Outback Ecology 2014b. *Northern Minerals Limited Browns Range Project – Terrestrial Vertebrate Fauna Impact Assessment June 2014*. Prepared for Northern Minerals Limited.

Outback Ecology 2014c. *Duncan/Gordon Downs Road Upgrade Project Level 1 Vegetation, Flora and Fauna Survey December 2014*. Prepared for Northern Minerals Limited.

Shepherd, D.P. Beeston, G.R., and Hopkins, A.J.M. 2002. Native Vegetation in Western Australia: extent, type and status. Department of Agriculture, Western Australia, Resource Management Technical Report 249.

Slater, P. Slater, P. and Slater, R. 2003. *The Slater Field Guide to Australian Birds*. Reed New Holland Publishing.

Schoknecht N. and Payne A.L. 2011. *Land Systems of the Kimberley Region, Western Australia*. Department of Agriculture and Food, Western Australia, Perth. Technical Bulletin 98.

Threatened Species Scientific Committee. 2016a. *Conservation Advice – Pezoporus occidentalis – Night Parrot*. Available at:
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-15072016.pdf>

Threatened Species Scientific Committee. 2016b. *Conservation Advice – Macroderma gigas*. Available at: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/174-conservation-advice-05052016.pdf>

Triggs, B. 2004. *Tracks, Scats and Other Traces – A Field Guide to Australian Mammals Revised Edition*. Oxford University Press.

10 APPENDICES

Appendix	Title
Appendix 1	DBCA NatureMap Search Results
Appendix 2	DoEE Protected Matters Search Tool Results
Appendix 3	Species List
Appendix 4	Land System Descriptions (Schoknecht and Payne 2011)
Appendix 5	Greater Bilby Site Assessment (Envisage Environmental 2020)

Appendix 1: DBCA NatureMap Search Results



NatureMap Species Report 1

Created By Guest user on 23/03/2020

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	128° 14' 12" E, 18° 25' 19" S
Buffer	40km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	101	404
Rare or likely to become extinct	3	3
TOTAL	104	407

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24473 <i>Falco hypoleucos</i> (Grey Falcon)		T	
2.	24180 <i>Macroderma gigas</i> (Ghost Bat)		T	
3.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
Non-conservation taxon				
4.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
5.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
6.	24719 <i>Aprosmictus erythropterus</i> (Red-winged Parrot)			
7.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
8.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
9.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
10.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
11.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
12.	24355 <i>Artamus minor</i> (Little Woodswallow)			
13.	25713 <i>Cacatua galerita</i> (Sulphur-crested Cockatoo)			
14.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
15.	25600 <i>Centropus phasianinus</i> (Pheasant Coucal)			
16.	47905 <i>Ceyx azureus</i> (Azure Kingfisher)			
17.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
18.	25756 <i>Cisticola exilis</i> (Golden-headed Cisticola)			
19.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
20.	24611 <i>Colluricincla harmonica</i> subsp. <i>brunnea</i> (Grey Shrike-thrush)			
21.	24615 <i>Colluricincla woodwardi</i> (Sandstone Shrike-thrush)			
22.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
23.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
24.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
25.	25593 <i>Corvus orru</i> (Torresian Crow)			
26.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
27.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
28.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
29.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
30.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
31.	25371 <i>Cyclorana australis</i> (Giant Frog)			
32.	25374 <i>Cyclorana longipes</i> (Long-footed Frog)			
33.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
34.	24996 <i>Delma borea</i>			
35.	41400 <i>Demansia nimicola</i> (whipsnake)			
36.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
37.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
38.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
39.	<i>Egretta novaehollandiae</i>			
40.	<i>Elanus axillaris</i>			
41.	47937 <i>Eiseyornis melanops</i> (Black-fronted Dotterel)			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
42.	24631 <i>Emblema pictum</i> (Painted Finch)			
43.	<i>Eolophus roseicapillus</i>			
44.	25578 <i>Ephippiorhynchus asiaticus</i> (Black-necked Stork)			
45.	24837 <i>Eremiornis carteri</i> (Spinifex-bird)			
46.	25621 <i>Falco berigora</i> (Brown Falcon)			
47.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
48.	24476 <i>Falco subniger</i> (Black Falcon)			
49.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
50.	24402 <i>Geopelia humeralis</i> (Bar-shouldered Dove)			
51.	25585 <i>Geopelia striata</i> (Zebra Dove)			
52.	24443 <i>Gallina cyanoleuca</i> (Magpie-Lark)			
53.	24484 <i>Grus rubicunda</i> (Brolga)			
54.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
55.	24297 <i>Hamirostra melanostemon</i> (Black-breasted Buzzard)			
56.	24833 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
57.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
58.	25380 <i>Litoria caerulea</i> (Green Tree Frog)			
59.	25385 <i>Litoria inermis</i> (Bumpy Rocket Frog)			
60.	25390 <i>Litoria pallida</i> (Pale Rocket Frog)			
61.	25392 <i>Litoria rubella</i> (Little Red Tree Frog)			
62.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
63.	<i>Malurus lamberti</i> subsp. <i>assimilis</i> x <i>rogersi</i>			
64.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
65.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
66.	25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
67.	24736 <i>Melopittacus undulatus</i> (Budgerigar)			
68.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
69.	25542 <i>Milvus migrans</i> (Black Kite)			
70.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
71.	<i>Missulena occatoria</i>			
72.	25194 <i>Morethia ruficauda</i> subsp. <i>ruficauda</i>			
73.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
74.	25684 <i>Neochmia phaeton</i> (Crimson Finch)			
75.	25747 <i>Ninox connivens</i> (Barking Owl)			
76.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
77.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
78.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
79.	24608 <i>Oriolus sagittatus</i> (Olive-backed Oriole)			
80.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
81.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
82.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
83.	24629 <i>Pardalotus striatus</i> subsp. <i>uropygialis</i> (Striated Pardalote)			
84.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
85.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
86.	25668 <i>Philemon citreogularis</i> (Little Friarbird)			
87.	42305 <i>Platyplectrum ornatum</i> (Ornate Burrowing Frog)			
88.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
89.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
90.	25199 <i>Proablepharus reginae</i>			
91.	25725 <i>Ptilonorhynchus nuchalis</i> (Great Bowerbird)			
92.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
93.	30948 <i>Smicrornis brevirostris</i> (Weebill)			
94.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
95.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
96.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
97.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
98.	30872 <i>Taeniopygia bichenovii</i> (Double-barred Finch)			
99.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
100.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
101.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
102.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
103.	24848 <i>Turnix pyrrhotorax</i> (Red-chested Button-quail)			
104.	25577 <i>Vanellus miles</i> (Masked Lapwing)			

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

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Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
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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.

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NatureMap Species Report 2

Created By Guest user on 23/03/2020

Kingdom Animalia
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	133	630
Priority 4	1	1
Protected under international agreement	1	1
Rare or likely to become extinct	4	4
TOTAL	139	636

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24473 <i>Falco hypoleucos</i> (Grey Falcon)		T	
2.	24180 <i>Macroderma gigas</i> (Ghost Bat)		T	
3.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyle, Ninu)		T	
4.	24542 <i>Malurus coronatus</i> subsp. <i>coronatus</i> (Purple-crowned Fairy-wren (western))		T	
Protected under international agreement				
5.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
Priority 4				
6.	24632 <i>Erythrura gouldiae</i> (Gouldian Finch)		P4	
Non-conservation taxon				
7.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
8.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
9.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
10.	42372 <i>Amalosia rhombifer</i> (Zigzag velvet gecko)			
11.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
12.	24317 <i>Anseranas semipalmata</i> (Magpie Goose, Pied Goose)			
13.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
14.	24719 <i>Aprosmictus erythropterus</i> (Red-winged Parrot)			
15.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
16.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
17.	41324 <i>Ardea modesta</i> (great egret, white egret)			
18.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
19.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
20.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
21.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
22.	24355 <i>Artamus minor</i> (Little Woodswallow)			
23.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
24.	24318 <i>Aythya australis</i> (Hardhead)			
25.	25715 <i>Cacatua roseicapilla</i> (Galah)			
26.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
27.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
28.	47905 <i>Ceyx azureus</i> (Azure Kingfisher)			
29.	42382 <i>Chelodina burrungandjii</i> (Northern Long-necked Turtle)			
30.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
31.	25756 <i>Cisticola exilis</i> (Golden-headed Cisticola)			
32.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
33.	24615 <i>Colluricincla woodwardi</i> (Sandstone Shrike-thrush)			
34.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
35.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
36.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
37.	25569 <i>Coracina papuensis</i> (White-bellied Cuckoo-shrike, Little Cuckoo-shrike)			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
38.	25593 <i>Corvus orru</i> (Torresian Crow)			
39.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
40.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
41.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
42.	30890 <i>Cryptoblepharus ruber</i>			
43.	25055 <i>Ctenolus militaris</i>			
44.	25371 <i>Cyclorana australis</i> (Giant Frog)			
45.	25374 <i>Cyclorana longipes</i> (Long-footed Frog)			
46.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
47.	24996 <i>Delma borea</i>			
48.	41400 <i>Demansia rimicola</i> (whipsnake)			
49.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
50.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
51.	24894 <i>Diporiphora lalliae</i>			
52.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
53.	<i>Egretta novaehollandiae</i>			
54.	47937 <i>Euseiornis melanops</i> (Black-fronted Dotterel)			
55.	24631 <i>Emblema pictum</i> (Painted Finch)			
56.	25341 <i>Emydura victoriae</i> (Northern Red-faced Turtle)			
57.	<i>Eolophus roseicapillus</i>			
58.	24837 <i>Eremiornis carteri</i> (Spinifex-bird)			
59.	24379 <i>Erythronyctes albus</i> (Red-kneed Dotterel)			
60.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
61.	25591 <i>Eurystomus orientalis</i> (Dollarbird)			
62.	25621 <i>Falco berigora</i> (Brown Falcon)			
63.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
64.	24476 <i>Falco subniger</i> (Black Falcon)			
65.	25727 <i>Fulica atra</i> (Eurasian Coot)			
66.	24956 <i>Gehyra pilbara</i>			
67.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
68.	24402 <i>Geopelia humeralis</i> (Bar-shouldered Dove)			
69.	25585 <i>Geopelia striata</i> (Zebra Dove)			
70.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
71.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
72.	24484 <i>Grus rubicunda</i> (Brolga)			
73.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
74.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
75.	24633 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
76.	47965 <i>Hieraetus morphnoides</i> (Little Eagle)			
77.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
78.	25139 <i>Lerista greeri</i>			
79.	25159 <i>Lerista orientalis</i>			
80.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
81.	25385 <i>Litoria inermis</i> (Bumpy Rocket Frog)			
82.	25390 <i>Litoria pallida</i> (Pale Rocket Frog)			
83.	25392 <i>Litoria rubella</i> (Little Red Tree Frog)			
84.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
85.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
86.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
87.	25665 <i>Meliphaga munda</i> (Black-chinned Honeyeater)			
88.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
89.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
90.	<i>Microcarbo melanoleucos</i>			
91.	25693 <i>Microeca fascians</i> (Jacky Winter)			
92.	25542 <i>Milvus migrans</i> (Black Kite)			
93.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
94.	<i>Missulena occatoria</i>			
95.	25194 <i>Morethia ruficauda</i> subsp. <i>ruficauda</i>			
96.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
97.	24448 <i>Myiagra inquieta</i> subsp. <i>nana</i> (Restless Flycatcher)			
98.	25684 <i>Neochmia phaeton</i> (Crimson Finch)			
99.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
100.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
101.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
102.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
103.	24608 <i>Ornolus sagittatus</i> (Olive-backed Oriole)			
104.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
105.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
106.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
107.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			

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	¹ Endemic To Query Area
108.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
109.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
110.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
111.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
112.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
113.	24411 <i>Phaps histrionica</i> (Flock Bronzewing, Flock Pigeon)			
114.	25667 <i>Philemon argenteiceps</i> (Silver-crowned Friarbird)			
115.	25668 <i>Philemon citreogularis</i> (Little Friarbird)			
116.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
117.	42305 <i>Platylepctrum ornatum</i> (Ornate Burrowing Frog)			
118.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
119.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
120.	25688 <i>Poephila personata</i> (Masked Finch)			
121.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
122.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
123.	25725 <i>Ptilonorhynchus nuchalis</i> (Great Bowerbird)			
124.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
125.	30948 <i>Smicrornis brevirostris</i> (Weebill)			
126.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
127.	25306 <i>Suta ordensis</i> (Ord Snake)			
128.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
129.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
130.	30872 <i>Taeniopygia bichenovii</i> (Double-barred Finch)			
131.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
132.	24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat)			
133.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
134.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
135.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
136.	24848 <i>Turnix pyrrhoroax</i> (Red-chested Button-quail)			
137.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
138.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
139.	24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			

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 Species Report 3

Created By Guest user on 23/03/2020

Kingdom Animalia
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	89	231
Priority 4	1	1
Rare or likely to become extinct	2	2
TOTAL	92	234

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Rare or likely to become extinct				
1.	24473 <i>Falco hypoleucos</i> (Grey Falcon)		T	
2.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyle, Ninu)		T	
Priority 4				
3.	24632 <i>Erythrura gouldiae</i> (Gouldian Finch)		P4	
Non-conservation taxon				
4.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
5.	42372 <i>Amalosia rhombifer</i> (Zigzag velvet gecko)			
6.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
7.	24317 <i>Anseranas semipalmata</i> (Magpie Goose, Pied Goose)			
8.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
9.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
10.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
11.	41324 <i>Ardea modesta</i> (great egret, white egret)			
12.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
13.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
14.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
15.	24355 <i>Artamus minor</i> (Little Woodswallow)			
16.	24318 <i>Aythya australis</i> (Hardhead)			
17.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
18.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
19.	25756 <i>Cisticola exilis</i> (Golden-headed Cisticola)			
20.	24615 <i>Colluricincla woodwardi</i> (Sandstone Shrike-thrush)			
21.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
22.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
23.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
24.	25593 <i>Corvus orru</i> (Torresian Crow)			
25.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
26.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
27.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
28.	30890 <i>Cryptoblepharus ruber</i>			
29.	25055 <i>Ctenotus militaris</i>			
30.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
31.	24996 <i>Delma borea</i>			
32.	41400 <i>Demansia rimicola</i> (whipsnake)			
33.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
34.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
35.	24894 <i>Diporiphora lalliae</i>			
36.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
37.	47937 <i>Elsyornis melanops</i> (Black-fronted Dotterel)			
38.	<i>Eolophus roseicapillus</i>			
39.	25621 <i>Falco berigora</i> (Brown Falcon)			

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.	25622 <i>Falco oenochroides</i> (Australian Kestrel, Nankeen Kestrel)			
41.	24476 <i>Falco subniger</i> (Black Falcon)			
42.	25727 <i>Fulica atra</i> (Eurasian Coot)			
43.	24956 <i>Gehyra pilbara</i>			
44.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
45.	25585 <i>Geopelia striata</i> (Zebra Dove)			
46.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
47.	24443 <i>Grallina cyanoleuca</i> (Maggie-lark)			
48.	24484 <i>Grus rubicunda</i> (Brolga)			
49.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
50.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
51.	24633 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
52.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
53.	25139 <i>Lerista greeni</i>			
54.	25159 <i>Lerista orientalis</i>			
55.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
56.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
57.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
58.	25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
59.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
60.	<i>Microcarbo melanoleucos</i>			
61.	25542 <i>Milvus migrans</i> (Black Kite)			
62.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
63.	<i>Missulena occatoria</i>			
64.	25194 <i>Morethia ruficauda</i> subsp. <i>ruficauda</i>			
65.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
66.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
67.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
68.	24618 <i>Oreocia gutturalis</i> (Crested Bellbird)			
69.	24608 <i>Oriolus sagittatus</i> (Olive-backed Oriole)			
70.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
71.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
72.	25668 <i>Philemon citreogularis</i> (Little Friarbird)			
73.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
74.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
75.	25688 <i>Poephila personata</i> (Masked Finch)			
76.	25725 <i>Ptilonorhynchus nuchalis</i> (Great Bowerbird)			
77.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
78.	30948 <i>Smicronis brevirostris</i> (Weebill)			
79.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
80.	25306 <i>Suta ordensis</i> (Ord Snake)			
81.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
82.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
83.	30872 <i>Taeniopygia bichenovii</i> (Double-barred Finch)			
84.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
85.	24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat)			
86.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
87.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
88.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
89.	24848 <i>Turnix pyrrhorostris</i> (Red-chested Button-quail)			
90.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
91.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
92.	24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			

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 Species Report 4

Created By Guest user on 23/03/2020

Kingdom	Animalia
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	111	275
Protected under international agreement	1	8
Rare or likely to become extinct	2	3
TOTAL	114	286

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Rare or likely to become extinct				
1.	24473 <i>Falco hypoleucos</i> (Grey Falcon)		T	
2.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
Protected under international agreement				
3.	24792 <i>Gallinago megala</i> (Swinhoe's Snipe)		IA	
Non-conservation taxon				
4.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
5.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
6.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
7.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
8.	24317 <i>Anseranas semipalmata</i> (Magpie Goose, Pied Goose)			
9.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
10.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
11.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
12.	41324 <i>Ardea modesta</i> (great egret, white egret)			
13.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
14.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
15.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
16.	24355 <i>Artamus minor</i> (Little Woodswallow)			
17.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
18.	24318 <i>Aythya australis</i> (Hardhead)			
19.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
20.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
21.	24564 <i>Certhionyx variegatus</i> (Pied Honeyeater)			
22.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
23.	24565 <i>Cissomela pectoralis</i> (Banded Honeyeater)			
24.	25756 <i>Cisticola exilis</i> (Golden-headed Cisticola)			
25.	24615 <i>Colluricincla woodwardi</i> (Sandstone Shrike-thrush)			
26.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
27.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
28.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
29.	25593 <i>Corvus orru</i> (Torresian Crow)			
30.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
31.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
32.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
33.	30890 <i>Cryptoblepharus ruber</i>			
34.	25045 <i>Ctenotus helenae</i>			
35.	25055 <i>Ctenotus militaris</i>			
36.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
37.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
38.	24996 <i>Delma borea</i>			
39.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			

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.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
41.	24892 <i>Diporiphora bennettii</i>			
42.	24894 <i>Diporiphora lalliae</i>			
43.	47937 <i>Elseomyias melanops</i> (Black-fronted Dotterel)			
44.	<i>Eolophus roseicapillus</i>			
45.	25621 <i>Falco berigora</i> (Brown Falcon)			
46.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
47.	24476 <i>Falco subniger</i> (Black Falcon)			
48.	24041 <i>Felis catus</i> (Cat)	Y		
49.	25727 <i>Fulica atra</i> (Eurasian Coot)			
50.	24956 <i>Gehyra pilbara</i>			
51.	24957 <i>Gehyra purpurascens</i>			
52.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
53.	25585 <i>Geopelia striata</i> (Zebra Dove)			
54.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
55.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
56.	24484 <i>Grus rubicunda</i> (Brolga)			
57.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
58.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
59.	24633 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
60.	<i>Isopedella gibsoni</i>			
61.	25139 <i>Lerista greeri</i>			
62.	25159 <i>Lerista orientalis</i>			
63.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
64.	24582 <i>Lichmera indistincta subsp. indistincta</i> (Brown Honeyeater)			
65.	<i>Lophochroa leadbeateri</i>			
66.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
67.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
68.	24550 <i>Malurus melanocephalus subsp. cruentatus</i> (Red-backed Fairy-wren)			
69.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
70.	25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
71.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
72.	<i>Microcarbo melanoleucos</i>			
73.	24655 <i>Microeca fascians subsp. fascians</i> (Jacky Winter)			
74.	25542 <i>Milvus migrans</i> (Black Kite)			
75.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
76.	<i>Missulena occatoria</i>			
77.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
78.	25684 <i>Neochmia phaeton</i> (Crimson Finch)			
79.	25197 <i>Notoscincus ornatus subsp. ornatus</i>			
80.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
81.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
82.	24618 <i>Oreica gutturalis</i> (Crested Bellbird)			
83.	24608 <i>Oriolus sagittatus</i> (Olive-backed Oriole)			
84.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
85.	24624 <i>Pachycephala rufiventris subsp. rufiventris</i> (Rufous Whistler)			
86.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
87.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
88.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
89.	25668 <i>Philemon citreogularis</i> (Little Friarbird)			
90.	24592 <i>Philemon citreogularis subsp. citreogularis</i> (Little Friarbird)			
91.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
92.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
93.	25688 <i>Poephila personata</i> (Masked Finch)			
94.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
95.	24684 <i>Pomatostomus temporalis subsp. rubeculus</i> (Grey-crowned Babbler)			
96.	25725 <i>Ptilonorhynchus nuchalis</i> (Great Bowerbird)			
97.	24758 <i>Ptilonorhynchus nuchalis subsp. nuchalis</i> (Great Bowerbird)			
98.	42323 <i>Ptilotula keartlandi</i> (Grey-headed Honeyeater)			
99.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
100.	24456 <i>Rhipidura rufiventris subsp. isura</i> (Northern Fantail)			
101.	30948 <i>Smicronis brevirostris</i> (Weebill)			
102.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
103.	42348 <i>Stomiopera unicolor subsp. unicolor</i> (White-gaped Honeyeater)			
104.	24925 <i>Strophurus ciliaris subsp. ciliaris</i>			
105.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
106.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
107.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
108.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
109.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			

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	¹ Endemic To Query Area
110.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
111.	24309 <i>Todiramphus sanctus subsp. sanctus</i> (Sacred Kingfisher)			
112.	24754 <i>Trichoglossus haematodus subsp. rubitorquis</i> (Red-collared Lorikeet)			
113.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
114.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			

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 Species Report 5

Created By Guest user on 23/03/2020

Kingdom Animalia
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	101	247
Protected under international agreement	1	8
Rare or likely to become extinct	1	2
TOTAL	103	257

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
Protected under international agreement				
2.	24792 <i>Gallinago megala</i> (Swinhoe's Snipe)		IA	
Non-conservation taxon				
3.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
4.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
5.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
6.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
7.	24317 <i>Anseranas semipalmata</i> (Magpie Goose, Pied Goose)			
8.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
9.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
10.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
11.	41324 <i>Ardea modesta</i> (great egret, white egret)			
12.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
13.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
14.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
15.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
16.	24318 <i>Aythya australis</i> (Hardhead)			
17.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
18.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
19.	24564 <i>Certhionyx variegatus</i> (Pied Honeyeater)			
20.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
21.	24565 <i>Cissomela pectoralis</i> (Banded Honeyeater)			
22.	25756 <i>Cisticola exilis</i> (Golden-headed Cisticola)			
23.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
24.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
25.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
26.	25593 <i>Corvus orru</i> (Torresian Crow)			
27.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
28.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
29.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
30.	30890 <i>Cryptoblepharus ruber</i>			
31.	25045 <i>Ctenotus helenae</i>			
32.	25055 <i>Ctenotus militaris</i>			
33.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
34.	24996 <i>Delma borea</i>			
35.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
36.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
37.	24892 <i>Diporiphora bennettii</i>			
38.	24894 <i>Diporiphora lalliae</i>			
39.	47937 <i>Elseomyias melanops</i> (Black-fronted Dotterel)			



Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
40.	<i>Eolophus roseicapillus</i>			
41.	25621 <i>Falco berigora</i> (Brown Falcon)			
42.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
43.	24476 <i>Falco subniger</i> (Black Falcon)			
44.	24041 <i>Felis catus</i> (Cat)	Y		
45.	25727 <i>Fulica atra</i> (Eurasian Coot)			
46.	24956 <i>Gehyra piibara</i>			
47.	24957 <i>Gehyra purpurascens</i>			
48.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
49.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
50.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
51.	24484 <i>Grus rubicunda</i> (Brolga)			
52.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
53.	24297 <i>Hamirostra melanostemon</i> (Black-breasted Buzzard)			
54.	24633 <i>Heteromunia pectoralis</i> (Pictorella Mannikin)			
55.	<i>Isopedella gibsandii</i>			
56.	25139 <i>Lerista greeri</i>			
57.	25159 <i>Lerista orientalis</i>			
58.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
59.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
60.	<i>Lophochroa leadbeateri</i>			
61.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
62.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
63.	24550 <i>Malurus melanocephalus</i> subsp. <i>cruentatus</i> (Red-backed Fairy-wren)			
64.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
65.	25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
66.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
67.	24655 <i>Microeca fascians</i> subsp. <i>fascians</i> (Jacky Winter)			
68.	25542 <i>Milvus migrans</i> (Black Kite)			
69.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
70.	<i>Missulena occatoria</i>			
71.	25684 <i>Neochmia phaeton</i> (Crimson Finch)			
72.	25197 <i>Notoscincus ornatus</i> subsp. <i>ornatus</i>			
73.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
74.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
75.	24618 <i>Oreica gutturalis</i> (Crested Bellbird)			
76.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
77.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
78.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
79.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
80.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
81.	24592 <i>Philemon citreogularis</i> subsp. <i>citreogularis</i> (Little Friarbird)			
82.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
83.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
84.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
85.	24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler)			
86.	24758 <i>Ptilonorhynchus nuchalis</i> subsp. <i>nuchalis</i> (Great Bowerbird)			
87.	42323 <i>Ptilotula keartlandi</i> (Grey-headed Honeyeater)			
88.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
89.	24456 <i>Rhipidura rufiventris</i> subsp. <i>isura</i> (Northern Fantail)			
90.	30948 <i>Smicrornis brevirostris</i> (Weebill)			
91.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
92.	42348 <i>Stomiopera unicolor</i> subsp. <i>unicolor</i> (White-gaped Honeyeater)			
93.	24925 <i>Strophurus ciliaris</i> subsp. <i>ciliaris</i>			
94.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
95.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
96.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
97.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
98.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
99.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
100.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
101.	24754 <i>Trichoglossus haematodus</i> subsp. <i>rubitorquis</i> (Red-collared Lorikeet)			
102.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
103.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			

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

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	¹ Endemic To Query Area
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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 Species Report 5

Created By Guest user on 23/03/2020

Kingdom Animalia
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	161	851
Priority 4	2	4
Protected under international agreement	2	10
Rare or likely to become extinct	1	3
TOTAL	166	868

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
Protected under international agreement				
2.	24378 <i>Charadrius veredus</i> (Oriental Plover)		IA	
3.	24792 <i>Gallinago megala</i> (Swinhoe's Snipe)		IA	
Priority 4				
4.	24122 <i>Lagorchestes conspicillatus</i> subsp. <i>leichardti</i> (Spectacled Hare-wallaby (mainland))		P4	
5.	24217 <i>Leggadina lakedownensis</i> (Northern Short-tailed Mouse, Lakeland Downs Mouse, Kerakenga)		P4	
Non-conservation taxon				
6.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
7.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
8.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
9.	24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk)			
10.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
11.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
12.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
13.	24317 <i>Anseranas semipalmata</i> (Magpie Goose, Pied Goose)			
14.	25670 <i>Anthus australis</i> (Australian Pipit)			
15.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
16.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
17.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
18.	41324 <i>Ardea modesta</i> (great egret, white egret)			
19.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
20.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
21.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
22.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
23.	24318 <i>Aythya australis</i> (Hardhead)			
24.	25334 <i>Brachyurophis roperi</i> (Northern Shovel-nosed Snake)			
25.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
26.	24722 <i>Cacatua leadbeateri</i> (Major Mitchell's Cockatoo)			
27.	25715 <i>Cacatua roseicapilla</i> (Galah)			
28.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
29.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
30.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
31.	24254 <i>Camelus dromedarius</i> (Dromedary, Camel)	Y		
32.	25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink)			
33.	24564 <i>Certhionyx variegatus</i> (Pied Honeyeater)			
34.	24181 <i>Chaerephon jobensis</i> (Greater Northern Freetail-bat, Northern Mastiff Bat)			
35.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattleed Bat)			
36.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			

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
37.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
38.	24565 <i>Cissomela pectoralis</i> (Banded Honeyeater)			
39.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
40.	24566 <i>Conopophila rufogularis</i> (Rufous-throated Honeyeater)			
41.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
42.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
43.	24416 <i>Corvus bennetti</i> (Little Crow)			
44.	25593 <i>Corvus orru</i> (Torresian Crow)			
45.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
46.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
47.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
48.	30890 <i>Cryptoblepharus ruber</i>			
49.	25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
50.	25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon)			
51.	25462 <i>Ctenotus grandis</i>			
52.	25045 <i>Ctenotus helenae</i>			
53.	25048 <i>Ctenotus inornatus</i>			
54.	25055 <i>Ctenotus militaris</i>			
55.	25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
56.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
57.	25062 <i>Ctenotus piankai</i>			
58.	25070 <i>Ctenotus robustus</i>			
59.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
60.	24996 <i>Delma borea</i>			
61.	41401 <i>Demansia shinei</i> (whipsnake)			
62.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
63.	24892 <i>Diporiphora bennettii</i>			
64.	24894 <i>Diporiphora lalliae</i>			
65.	25540 <i>Elanus caeruleus</i> (Black-shouldered Kite)			
66.	47937 <i>Eileyornis melanops</i> (Black-fronted Dotterel)			
67.	<i>Eolophus roseicapillus</i>			
68.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
69.	25621 <i>Falco berigora</i> (Brown Falcon)			
70.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
71.	25623 <i>Falco longipennis</i> (Australian Hobby)			
72.	24041 <i>Felis catus</i> (Cat)	Y		
73.	25727 <i>Fulica atra</i> (Eurasian Coot)			
74.	25301 <i>Furina ornata</i> (Moon Snake)			
75.	24954 <i>Gehyra nana</i>			
76.	24956 <i>Gehyra pilbara</i>			
77.	24957 <i>Gehyra purpurascens</i>			
78.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
79.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
80.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
81.	24484 <i>Grus rubicunda</i> (Brolga)			
82.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
83.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
84.	<i>Indolpium</i> sp.			
85.	<i>Isopedella gibsoni</i>			
86.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
87.	25139 <i>Lerista greeri</i>			
88.	25159 <i>Lerista orientalis</i>			
89.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
90.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
91.	<i>Lophochroa leadbeateri</i>			
92.	30933 <i>Lucasium stenodactylum</i>			
93.	24136 <i>Macropus rufus</i> (Red Kangaroo, Marlu)			
94.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
95.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
96.	25653 <i>Malurus melanocephalus</i> (Red-backed Fairy-wren)			
97.	24550 <i>Malurus melanocephalus</i> subsp. <i>cruentatus</i> (Red-backed Fairy-wren)			
98.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
99.	25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
100.	24736 <i>Melospittacus undulatus</i> (Budgerigar)			
101.	25184 <i>Menetia greyii</i>			
102.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
103.	24655 <i>Microeca fascians</i> subsp. <i>fascians</i> (Jacky Winter)			
104.	25542 <i>Milvus migrans</i> (Black Kite)			
105.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
106.	25495 <i>Morethia ruficauda</i>			

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Department of Biodiversity,
Conservation and Attractions





Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
107.	24223 <i>Mus musculus</i> (House Mouse)	Y		
108.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
109.	25684 <i>Neochmia phaeton</i> (Crimson Finch)			
110.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
111.	25197 <i>Notoscincus ornatus</i> subsp. <i>ornatus</i>			
112.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
113.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
114.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
115.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
116.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
117.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
118.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
119.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
120.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
121.	24592 <i>Philemon citreogularis</i> subsp. <i>citreogularis</i> (Little Friarbird)			
122.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
123.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
124.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
125.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
126.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
127.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
128.	24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler)			
129.	25200 <i>Proablepharus tenuis</i>			
130.	24103 <i>Pseudantechinus macdonnellensis</i> (Fat-tailed Pseudantechinus)			
131.	24234 <i>Pseudomys delicatulus</i> (Delicate Mouse)			
132.	24235 <i>Pseudomys desertor</i> (Desert Mouse)			
133.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
134.	24239 <i>Pseudomys nanus</i> (Western Chestnut Mouse)			
135.	24758 <i>Ptilonorhynchus nuchalis</i> subsp. <i>nuchalis</i> (Great Bowerbird)			
136.	42323 <i>Ptilotula keartlandi</i> (Grey-headed Honeyeater)			
137.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
138.	24456 <i>Rhipidura rufiventris</i> subsp. <i>isura</i> (Northern Fantail)			
139.	24174 <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tailed Bat)			
140.	24200 <i>Scotorepens greyii</i> (Little Broad-nosed Bat)			
141.	30948 <i>Smicrornis brevirostris</i> (Weebill)			
142.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
143.	24117 <i>Sminthopsis ooldea</i> (Ooldea Dunnart)			
144.	24120 <i>Sminthopsis youngsoni</i> (Lesser Hairy-footed Dunnart)			
145.	42348 <i>Stomiopera unicolor</i> subsp. <i>unicolor</i> (White-gaped Honeyeater)			
146.	25517 <i>Strophurus ciliaris</i>			
147.	24925 <i>Strophurus ciliaris</i> subsp. <i>ciliaris</i>			
148.	25269 <i>Suta fasciata</i> (Rosen's Snake)			
149.	25307 <i>Suta punctata</i> (Spotted Snake)			
150.	<i>Synothele karara</i>			
151.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
152.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
153.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
154.	24176 <i>Taphozous hilli</i> (Hill's Sheath-tail-bat)			
155.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
156.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
157.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
158.	24754 <i>Trichoglossus haematodus</i> subsp. <i>rubitorquis</i> (Red-collared Lorikeet)			
159.	24848 <i>Turnix pyrrhotorax</i> (Red-chested Button-quail)			
160.	24851 <i>Turnix velox</i> (Little Button-quail)			
161.	<i>Unixenus mjoebergi</i>			
162.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
163.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
164.	25212 <i>Varanus eremius</i> (Pygmy Desert Monitor)			
165.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			
166.	24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
Priority
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](#)

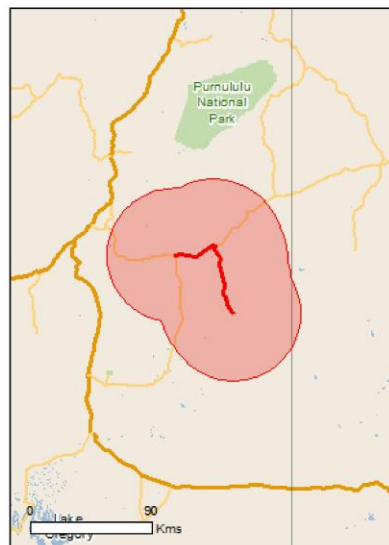
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

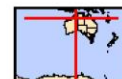
[Acknowledgements](#)



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		
Curlew 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]
Name	Threatened	Type of Presence
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
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		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Frogs

Rhinella marina 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] 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](#)
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- Natural history museums of Australia
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- [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: Species List from Site Assessment

Table 7. Species detected during Site Assessment

No	Common Name	Scientific Name	Habitat Encountered	Observation Type
Birds				
1	Masked Woodswallow	<i>Artamus personatus</i>	Black Soil Plains	Direct
2	Brown Falcon	<i>Falco berigora</i>	Black Soil Plains	Direct
3	Zebra Finch	<i>Poephilla guttata</i>	Black Soil Plains	Direct
4	Black Kite	<i>Milvus migrans</i>	All habitats	Direct
5	Whistling Kite	<i>Milvus sphenurus</i>	Black Soil Plains	Direct
6	Pictorella Mannikin	<i>Heteromunia pectoralis</i>	Black Soil Plains	Direct
7	Straw Necked Ibis	<i>Threskiornis spinicollis</i>	Black Soil Plains, Riparian/riverine vegetation	Direct
8	Australian White Ibis	<i>Threskiornis molucca</i>	Black Soil Plains, Riparian/riverine vegetation	Direct
9	Glossy Ibis	<i>Plegadis falcinellus</i>	Black Soil Plains, Riparian/riverine vegetation	Direct, recorded within Desktop Area
10	Australian Pratincole	<i>Stiltia isabella</i>	Black Soil Plains, Riparian/riverine vegetation	Direct
11	Oriental Pratincole	<i>Glareola maldivarum</i>	Riparian/riverine vegetation	Direct
12	Black-winged Stilt	<i>Himantopus himantopus</i>	Riparian/riverine vegetation	Direct
13	Masked Lapwing	<i>Vanellus miles</i>	Riparian/riverine vegetation	Direct
14	Great Egret	<i>Ardea alba</i>	Riparian/riverine vegetation	Direct
15	Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>	Riparian/riverine vegetation	Direct
16	White-faced Heron	<i>Ardea novaehollandiae</i>	Riparian/riverine vegetation	Direct
17	Plumed Whistling Duck	<i>Dendrocygna eytoni</i>	Riparian/riverine vegetation	Direct
18	Wandering Whistling Duck	<i>Dendrocygna arcuata</i>	Riparian/riverine vegetation	Direct
19	Pink-eared Duck	<i>Malacorhynchus membranaceus</i>	Riparian/riverine vegetation	Direct
20	Australian Grey Teal	<i>Anas gracilis</i>	Riparian/riverine vegetation	Direct
21	Pacific Black Duck	<i>Anas superciliosa</i>	Riparian/riverine vegetation	Direct
22	Brown Honeyeater	<i>Lichmera indistincta</i>	Riparian/riverine vegetation	Direct
23	Barn Swallow	<i>Hirundo rustica</i>	Riparian/riverine vegetation	Direct
24	Little Curlew	<i>Numenius minutus</i>	Black Soil Plains within Desktop Area	Direct
25	Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Black Soil Plains within Desktop Area	Direct
26	Red-tailed Black Cockatoo	<i>Calyptorhynchus banksia macrorhynchus</i>	Rocky Plains / Sandy Plains	Direct
27	Black-fronted Dotterell	<i>Charadrius melanops</i>	Riparian/riverine vegetation	Direct
28	Magpie Goose	<i>Anseranas semipalmata</i>	Riparian/riverine vegetation	Direct
29	Eurasian Coot	<i>Fulica atra</i>	Riparian/riverine vegetation	Direct
30	Hardhead Duck	<i>Aythya australis</i>	Riparian/riverine vegetation	Direct
31	Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	Rocky Plains	Direct
32	Magpie Lark	<i>Grallina cyanoleuca</i>	All habitats	Direct
33	Spinifex Pigeon	<i>Petrophassa plumifera</i>	Rocky Plains	Direct
34	Crested Pigeon	<i>Ocyphaps lophotes</i>	All habitats	Direct
35	Peaceful Dove	<i>Goepelia striata</i>	All habitats	Direct
36	Galah	<i>Cacatua roseicapilla</i>	All habitats	Direct

37	Little Corella	<i>Cacatua sanguinea</i>	All habitats	Direct
38	Rainbow Bee-eater	<i>Merops ornatus</i>	Riparian/riverine vegetation	Direct
39	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	All habitats	Direct
40	Willy Wagtail	<i>Rhipidura leucophrys</i>	All habitats	Direct
41	Little Friarbird	<i>Philemon citreogularis</i>	All habitats	Direct
Mammals				
1	Cattle	<i>Bos Taurus / Bos indicus</i>	All habitats	Direct
2	Dingo/Wild Dog	<i>Canis familiaris dingo</i>	Lateritic plains	Tracks
3	Feral Cat		Lateritic plains	Tracks
4	Red Kangaroo	<i>Macropus rufus</i>	Rocky Plains in Desktop Area	Direct
5	Wallaby	<i>Macropus sp.</i>	Lateritic Plains, Black Soil Plains, Sandy Plains	Tracks, Direct, Roadkill
6	?Nortnern Nail-tailed Wallaby	<i>Onychogalea unguifera</i>	Black Soil Plains	Roadkill
Reptiles				
1	Centralian Blue-tongue Skink	<i>Tiliqua multifasciata</i>	Black Soil Plains	Direct
2	Goanna	<i>Varanus sp.</i>	Black Soil Plains, Lateritic Plains	Direct, Burrow

Appendix 4: 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.

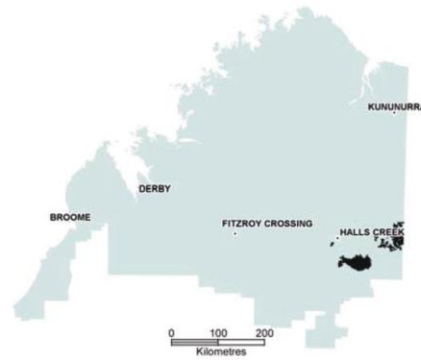
State land type: Undulating plains and uplands with eucalypt woodlands and spinifex.

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

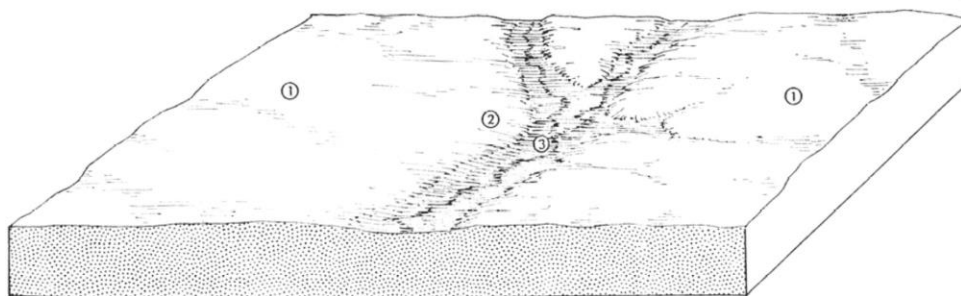
Geomorphology: Elevated lateritic plain (lateritic red earth and lateritic podzolic surface horizon).

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

Land systems of the Kimberley Region

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.

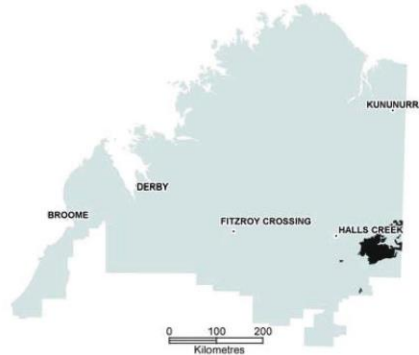
State land type: Alluvial plains with tussock grasslands.

Geology: Tertiary swamp, lake, and river deposits.

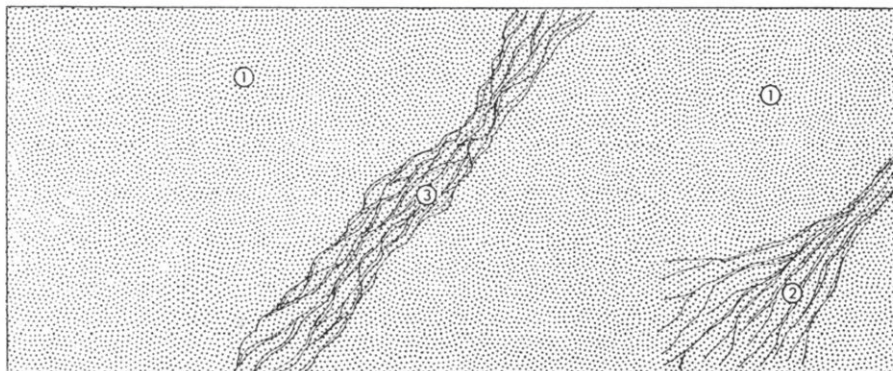
Geomorphology: Elevated non-lateritic plain (grey soils of heavy texture), interior fluvial plains, and interior swamp plains.

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>Astrebala 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.

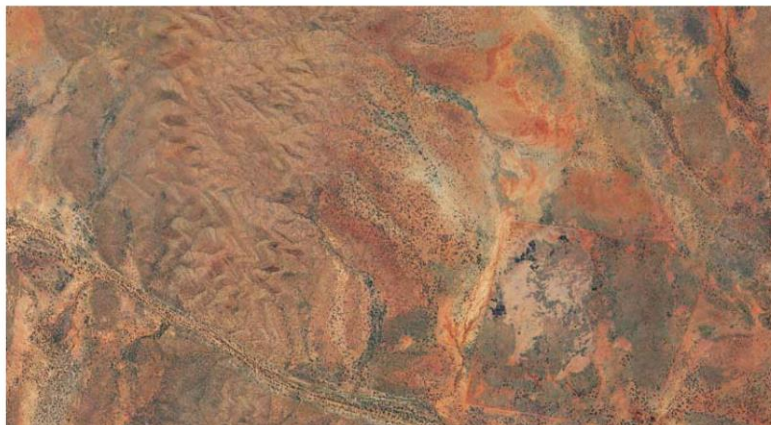
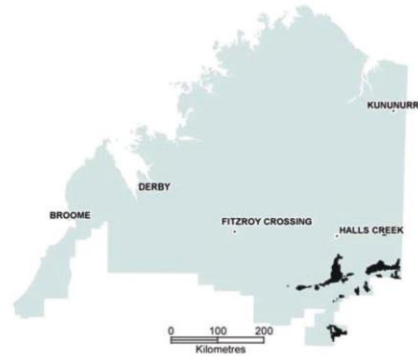
State land type: Hills and lowlands with eucalypt woodlands and spinifex

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

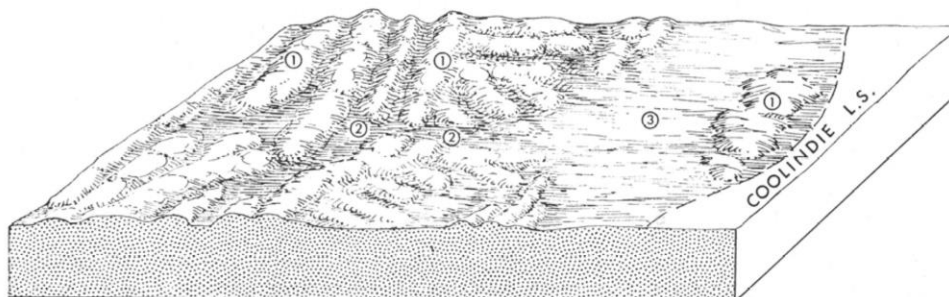
Geomorphology: Ancient monadnocks.

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 5: Greater Bilby Assessment