

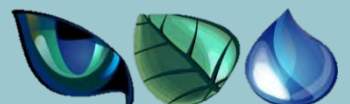


Horseshoe

Detailed Flora and Vegetation and Basic Fauna Survey



Prepared for Westgold Resources Limited
by Animal Plant Mineral Pty Ltd.



July 2026

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EXECUTIVE SUMMARY

Animal Plant Mineral Pty Ltd was commissioned by Westgold Resources Limited to undertake a Detailed Flora and Vegetation Survey and Basic Fauna Survey for the Horseshoe prospect. The Survey Area is located 120 kilometres (km) north of Meekatharra in the Midwest region of Western Australia (WA) approximately 22 km south east of the Fortnum Mill. The Survey Area is comprised of one continuous area, totalling 879.3 hectares (ha) and placed within the M52/338 and L52/102 tenement boundaries, plus a 200 m buffer around tenement L52/102. The Survey Area contains disturbances from historic prospecting and open cut mining with associated access tracks.

The survey was carried out in two periods – the 31st March 2026 and from the 8th to 10th of May 2026. Summer rainfall was below long-term average and median values and conditions were dry. The survey was conducted in the Primary survey period for the botanical region and conditions were suitable for the detection and determination of perennial flora, and the assigning of vegetation types, vegetation condition and fauna habitat quality and suitability. Seasonal conditions were a constraint for the detection of conservation significant flora.

Eight vegetation types were described for the Survey Area, all commonly occurring in the local and regional area. Locally occurring vegetation of conservation significance includes the Robinson Range vegetation complexes Banded Ironstone Formation, a Priority 1 Ecological Community, described by Meissner *et al.* (2009). Vegetation types of the Survey Area were compared with the Meissner *et al.* (2009) vegetation types. The 26.9 hectare (ha) area described by vegetation type (VT) 4, occurring on outcrops of ironstone, floristically and structurally resembles the Priority 1 Ecological Community, and has been designated as a Priority Ecological Community (PEC). Additionally, a small (0.48 ha) ironstone outcrop in the Access Road buffer has also been assigned as part of the PEC.

No Threatened Flora or Ecological Communities are known to occur in the local area or were recorded in the Survey Area.

One Priority (P) 3 flora *Eremophila obliquisejala* was recorded in low numbers from two locations, both at the western end of the access road. The species is known to occur in the regional area and is locally abundant at the nearby Greater Fortnum Project. One suspected P3 flora *Indigofera ?gilesii* (?P3) was recorded in low numbers from two locations, both near to the elevated portions of the Survey Area. *Indigofera gilesii* is known to occur in the local and regional area and suitable habitat is present with VT4. As the specimens could not be determined to species level the taxonomic determination is uncertain.

The likelihood of occurrence assessment for conservation significant flora indicated that the Threatened flora species *Pityrodia augustensis* may possibly occur in rocky outcrop areas, along with nine P flora assessed as likely or possibly occurring. Vegetation type 4 on the crests and upper slopes of eroded ironstone, and the small outcrop at HSQ1 within the Access Road buffer are potentially suitable habitat for *Pityrodia augustensis* and these nine P flora. As seasonal conditions were limiting at the time of survey, comprehensive targeted survey was not conducted. *Pityrodia augustensis* flowers between August and September and therefore this period is the recommended timing for conservation significant flora targeted survey.

The likelihood of occurrence assessment for conservation significant fauna indicated that potentially suitable habitat is present for two Threatened (T) species, one Priority (P) species and one Other Specially Protected (OS) species. Significance of the habitats present within the Survey Area are as follows:

- Southern Whiteface (listed as Vulnerable [VU] under the *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act] and Biodiversity Conservation Act [BC Act]) may possibly occur and suitable roosting habitat occurs in the Major Drainage Line habitats in the northeastern and southeastern corners of the Survey Area due to the presence of suitable tree hollows. The quality of the habitats present is poor due to the lack of foraging habitat as a consequence of poor rainfall exacerbated by high intensity grazing, predominantly by cattle but also by introduced predators. No Southern Whiteface were observed to be inhabiting the area at the time of survey.
- Grey Falcon (listed as VU under the EPBC and BC Acts) may possibly occur due to the presence of suitable foraging habitat, however due to the widespread availability of similar habitat the Survey Area does not contain important habitat for the species. No nests were observed in tall trees within riparian areas and no Grey Falcon observed.
- Long-tailed Dunnart (considered P4 in WA) is likely to occur as suitable habitat is present within the Laterite Breakaway Fauna Habitat and secondary signs indicate the habitat is occupied.
- Peregrine Falcon (listed as OS under the BC Act) may possibly occur due to the presence of suitable foraging habitat, however due to the widespread availability of similar habitat the Survey Area does not contain important habitat for the species.

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UNITS OF MEASURE

Unit	Measure
%	Percentage
°C	Degrees Celsius
ha	Hectare
km	Kilometre
m	Metre

LIST OF ABBREVIATIONS

Abbreviation	Meaning
ALA	Atlas of Living Australia
APM	Animal Plant Mineral Pty Ltd
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i> (WA)
BC Act	<i>Biodiversity Conservation Act 2016</i>
BIF	Banded Ironstone Formation
BoM	Bureau of Meteorology
CR	Critically Endangered
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environment Regulation
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
ESA	Environmentally Sensitive Area
GDE	Groundwater Dependent Ecosystem
GPS	Global Positioning System
MDS	Multi-Dimensional Scaling
MI	Migratory
MNES	Matters of National Environmental Significance
OS	Other Specially Protected
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
SRT	Short-range endemic
T	Threatened
TEC	Threatened Ecological Community
VU	Vulnerable
WA	Western Australia
WONS	Weeds of National Significance

1 INTRODUCTION

1.1 PROJECT AND LOCATION

Animal Plant Mineral Pty Ltd (APM) was commissioned by Westgold Resources Limited to undertake a Detailed Vegetation and Basic Fauna Survey for the Horseshoe mining area. The Survey Area is located 120 km north of Meekatharra in the Midwest region of Western Australia (WA), approximately 22 km south east of the Fortnum Mill. The Survey Area is comprised of one continuous area, totalling 879.3 ha and placed within the M52/338 and L52/102 tenement boundaries, plus a 200 m buffer around tenement L52/102. The location of the Survey Area is shown in Figure 1-1

1.2 SCOPE OF WORK

The field survey was conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment* (2016) and EPA (2020) *Technical Guidance - Fauna Surveys for Environmental Impact Assessment* at a Detailed and Basic level of assessment respectively. A Desktop Study preceded the field survey, as required by the guidance.

The aims of the desktop study were to:

- Establish vegetation associations and fauna habitats previously determined
- Identify Threatened (T) and Priority (P) flora, fauna and Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) previously recorded
- Identify Declared weed and introduced fauna species previously determined as present on site; and
- Identify potentially suitable habitat for conservation significant flora and fauna known from the region.

The aims of the field survey were to:

- Describe and consolidate vegetation associations present with reference to previous mapping/descriptions, particularly those describing PEC Robinson Range Vegetation Complexes (Banded Ironstone Formation [BIF])
- Describe and consolidate fauna habitats present on site with reference to suitable habitats for T or P species
- Record the presence and abundance of any T or P Flora encountered; and
- Record the presence and abundance of any Declared Weeds encountered.

Survey data accompanies this report in a format suitable for submission to the Index of Biodiversity Surveys for Assessment online portal.

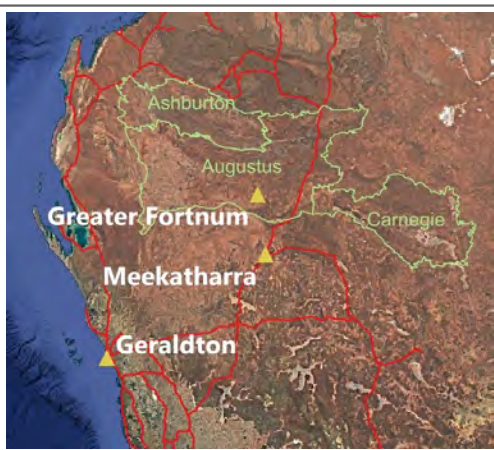


Author: EH Date: 19/07/2026

Project Location

Legend

-  Horseshoe Survey Area
-  IBRA Gascoyne Bioregion Subregions



2 BACKGROUND AND SUPPORTING INFORMATION

2.1 LEGISLATION AND GUIDANCE

2.1.1 Commonwealth Government EPBC Act

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, defined in the EPBC Act as Matters of National Environmental Significance (MNES).

If a project has the potential to significantly impact on MNES it is to be referred to the DCCEEW for determination on whether the matter is a 'controlled action' and therefore requiring assessment.

The EPBC Act provides for the identification and listing of species under several categories listed in Appendix A. The EPBC Act also provides for the development of conservation advice and recovery plans, development of a register of critical habitat, recognition of key threatening processes and the development of threat abatement plans.

2.1.2 Western Australia BC Act

The *Biodiversity Conservation Act 2016* (BC Act) provides a statutory basis for the listing of T species, specially protected species, extinct species, TECs, collapsed ecological communities, critical habitat and key threatening processes in WA. The BC Act provides for the listing of T flora and fauna species and ecological communities under specified conservation categories listed in Appendix A. Species and communities listed under the BC Act are protected and require authorisation by the Minister to take or disturb.

Species may also be listed as being of special conservation interest if they have a naturally low population, restricted natural range, are subject to or recovering from a significant population decline or reduction of range or are of special interest to science. Species of special conservation interest, migratory species and species subject to international agreements are known as Specially Protected Species in the BC Act.

2.1.3 Western Australia Priority species and communities

Flora and fauna species and communities are listed by the Department of Biodiversity, Conservation and Attractions (DBCA) as P when they are considered to have a greater level of significance than other native species and communities. This generally occurs where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to T species and communities categories. Whilst P species and communities are not specifically listed in the BC Act, all flora and fauna are protected in WA following the provisions in Part 10 of the BC Act. This protection applies even when a species is not listed as T or specially protected. The categories covering P species and communities are listed in Appendix A.

2.1.4 BAM Act

Plants may be 'Declared' by the Agriculture Protection Board under the *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act). Declared Plants are gazetted under three categories (C1-C3) which define the action required. Details of the definitions of these categories are provided in Appendix A. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is 'Declared', landholders are obliged to control that plant on their properties.

2.2 LAND USE

The Survey Area contains existing mine pits and waste facilities. The current land use is mining. The Survey Area is not within any pastoral lease area.

2.3 CLIMATE

The Project is located in the Midwest Region of WA, 140 km north of Meekatharra. The climate of the region is arid with mild winters and hot summers and a bimodal rainfall distribution with summer and winter rain. The nearest Bureau of Meteorology (BoM) weather station with a long historical record for rainfall is Bryah (BoM Site Number: 007008), approximately 30 km south of the Survey Area. Bryah has recorded rainfall from 1919 (106 years). The Meekatharra airport (BoM Site Number: 007045) has a more contemporary record for temperature, from 1950 to present day (76 years).

The average climate data recorded over these periods is shown in Figure 2-1. Monthly mean maximum temperature ranges from 19.3°C in July to 38.5°C in January. Monthly mean rainfall ranges from 3.8 mm in October to 35.7 mm in March. Mean annual rainfall is 209.9 mm and median annual rainfall is 94.5 mm (BoM 2026a), indicating that rainfall is very low most years and infrequent high rainfall occurs in association with cyclone activity.



Figure 2-1. Temperature and rainfall averages

2.4 BIOGEOGRAPHIC REGIONALISATION

The Interim Biogeographic Regionalisation for Australia (Version 7) classifies the Australian continent into regions (bioregions) of similar geology, landform, vegetation, fauna, and climate characteristics (Thackway and Cresswell 1995). The Interim Biogeographic Regionalisation for Australia mapping (Version 7), places the Project within the Gascoyne Bioregion.

The Gascoyne Bioregion consists of low, rugged ranges and broad, flat valleys. The vegetation is dominated by open mulga low woodlands.

The Gascoyne Bioregion is further subdivided into the Augustus, Ashburton and Carnegie Sub-regions. The Project lies entirely within the Augustus Sub-region which is characterised by sedimentary and granite ranges and broad flat valleys.

Desmond *et al.* (2001) describes the subregion, whose geological features includes the Narryera Complex and Bryah Basin of the Proterozoic Capricorn Orogen on the northern margin of the Yilgarn Craton, as well as the Archaean Marymia and Sylvania Inliers. Although the Gascoyne River System provides the main drainage of the Augustus subregion, it is also the headwaters of the Ashburton and Fortescue Rivers. There are extensive areas of alluvial valley-fill deposits. Mulga woodland with Triodia occur on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland.

2.5 LAND SYSTEMS, SOILS AND GEOLOGY

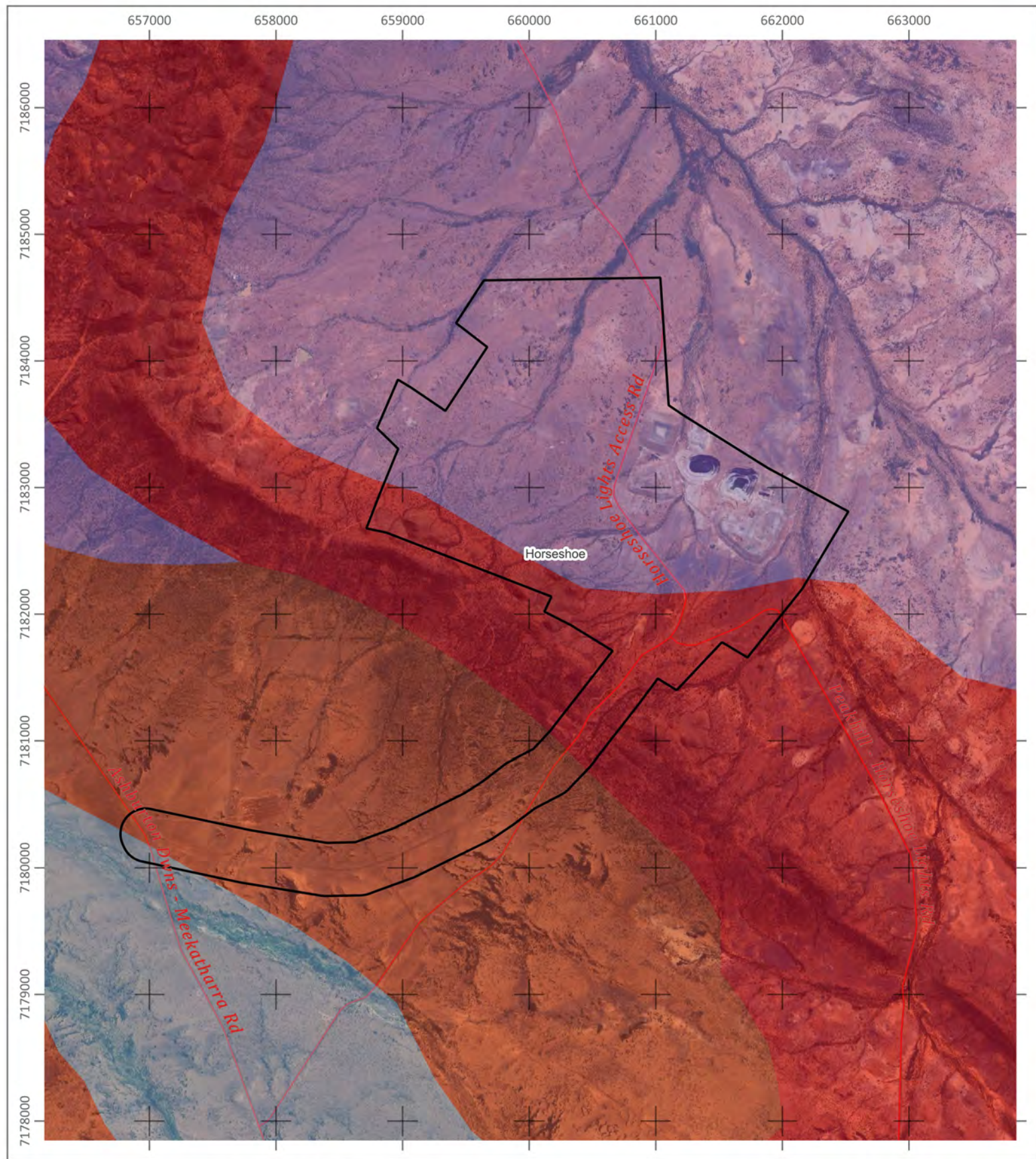
Mapping of Land Systems is available from Department of Primary Industry and Regional Development (DPIRD, 2025). The Survey Area falls within four soil landscape systems as listed in Table 2-1 and illustrated in Figure 2-2. Land Systems of the Gascoyne region were described by Wilcox and McKinnon (1972).

Table 2-1. Land Systems

Land System	Description
Beasley System	Low ridges, hills and lateritised residuals above stony footslopes and broad, stony lower plains supporting scattered mulga and snakewood shrublands. Ridges contain pockets of shallow soil and lower summits contain stripped laterised surfaces or red brown clay with rock. Red brown clay occurs in the lower elevation areas. Archean age igneous and sedimentary rocks form basement geology.
Horseshoe System	Gently undulating stony plains and low rounded hills with partially saline drainage foci and alluvial tracts supporting acacia and eremophila tall shrublands, and chenopod low shrublands. Basement geology and soils similar to Beasley.
Peak Hill System	Rugged, sinuous ranges and rounded hills of banded ironstone and hematitic shale, supporting stunted mulga and cottonbush shrublands. Soils are rocky and shallow in the hills and lower slopes, with some duplex soils or red-brown gritty clays of variable depth occurring in the drainage floors. Incised drainage features contain cobble or sand.

Land System	Description
Three Rivers System	Hardpan plains and minor sandy banks supporting sparse mulga shrublands. Alluvial plains have red brown gritty hard pan soils that may have a stone mantle. Sandier patches occur in groves and sandbanks

The Horseshoe area is located within the northern extent of the Robinson Ranges. These ranges spread over 200 km, beginning near the Great Northern Highway, approximately 50 km east of Peak Hill, and extending west to Mount Padbury. The ranges lie in the southern part of the Capricorn Orogen, an early Proterozoic orogenic belt (Gee 1987) and are dominated by BIFs forming major resistant ridges (Elias and Williams 1980). They are made up of varied proportions of banded iron formation and hematitic shales (Elias and Williams 1980). A low ridge of banded ironstone occurs on the western edge of the mining tenement between the access road and the existing mining disturbances, that is within the extent of the Robinson Ranges Land System (Figure 2-2).



Author: EH Date: 19/07/2026

Land Systems

Prepared for:



Figure 2-2

Scale: @ A4 1: 40,000



0 0.5 1 km

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator



Legend

- Horseshoe Survey Area
- Beasley System
- Horseshoe System
- Peak Hill System
- Three Rivers System



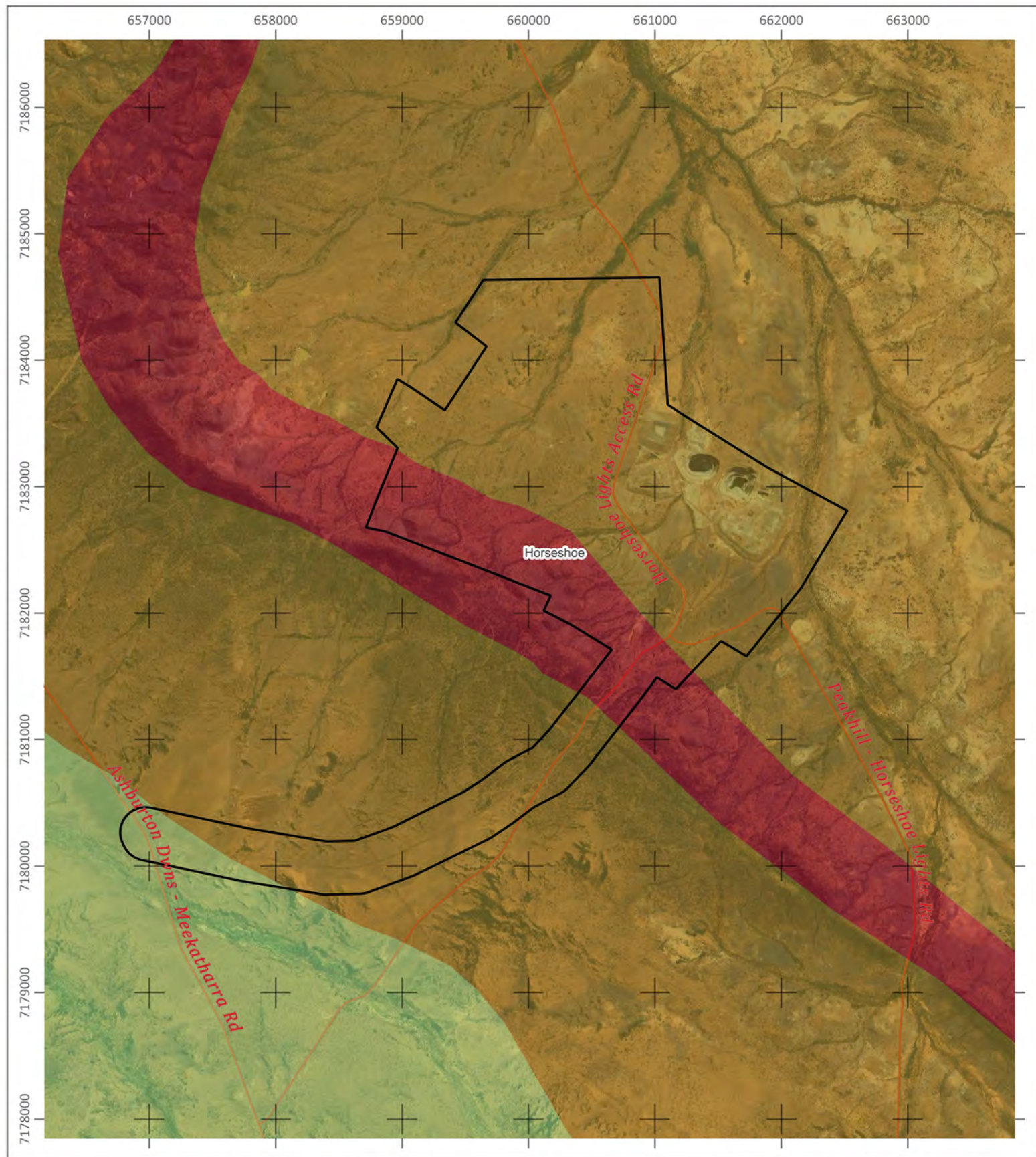
2.6 REGIONAL VEGETATION

The Survey Area is located within the Eremaean Botanical Province and contains three pre-European Beard vegetation associations of the Gascoyne Ranges System as shown in Figure 2-3 (DPIRD 2019b). The remaining extent of these vegetation associations is outlined in the most recent DBCA Statewide Vegetation Statistics table dated 2018 and summarised in Table 2-2 below.

Vegetation associations within and nearby the Survey Area have over 99% pre-European Vegetation extent remaining. Conservation significance ranking of vegetation associations occurring within and nearby the Survey Area are of 'Least Concern' and are widespread within the Gascoyne bioregion and Augustus sub-region.

Table 2-2 Pre-European Beard Vegetation Associations

Unit	Vegetation Description	Pre-European Extent (ha)	Current Extent (ha)	Pre-European Extent Remaining (%)	Current Extent within DBCA Managed Lands (%)
18	Low woodland, open low woodland or sparse woodland of <i>Acacia aneura</i> (Mulga) and associated species.	19,890,667	19,842,830	99.8	2.1
29	Low woodland, open low woodland or sparse woodland of <i>Acacia aneura</i> (Mulga) and associated species.	7,903,991	7,898,973	99.9	0.3
39	Scrub, open scrub or sparse scrub of <i>Acacia</i> spp. <i>Melaleuca</i> spp. and other species	6,613,419	6,602,535	99.8	7.3



Author: EH Date: 19/07/2026

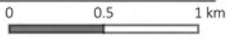
Pre-European Vegetation

Prepared for:



Figure 2-3

Scale: @ A4
1: 40,000



Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator



Legend

- Horseshoe Survey Area
- 18.0
- 29.0
- 39.0



2.7 ENVIRONMENTALLY SIGNIFICANT AREAS

2.7.1 Conservation Estate

The Western Australian Conservation Estate includes land and waters vested in the Conservation and Parks Commission under the *Conservation and Land Management Act 1984*. The Conservation Estate is managed by the Parks and Wildlife Service of DBCA to protect WA's biodiversity, and includes National Parks, Nature Reserves, Conservation Reserves, and other areas managed primarily for biodiversity conservation (Department of Environment and Energy 2016).

A search of the Collaborative Australian Protected Area Database returned no conservation estates located within 50 km of the Horseshoe Survey Area. The nearest gazetted conservation estates are Collier Range National Park 80 km to the northeast and Jilgu National Park 112 km to the northwest of the Survey Area.

2.7.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESA) are areas that are defined by the Department of Water and Environment Regulation (DWER) (2019) as:

- A declared World Heritage property as defined in s.13 of the EPBC Act;
- An area that is included on the Register of the National Estate, because of its natural heritage value under the *Australian Heritage Council Act 2003*;
- A defined wetland and the area within 50 m of the wetland;
- The area covered by vegetation within 50 m of T flora, to the extent to which the vegetation is continuous with the vegetation in which the T flora is located;
- The area covered by a TEC;
- A Bush Forever site;
- Areas covered by the Gnamptopneustes Mound Crown Land Policy and Western Swamp Tortoise Policy;
- Areas covered by lakes, wetlands, and fringing vegetation of the Swan Coastal Plain Lakes Policy, including Southwest Agricultural Zone Wetlands Policy and Swan and Canning Rivers Policy; and
- Protected wetlands as defined in the *Environmental Protection (Southwest Agricultural Zone Wetlands) Policy 1998*.

Environmentally Sensitive Areas can be viewed on the DWER clearing permit system map viewer. There are no ESAs within the Survey Area.

The Australian Wetlands Database includes nationally significant wetlands (as listed in the directory of important wetlands), wetlands listed under the Ramsar convention, wetlands that are representative, rare or unique, or wetlands that are considered of international importance (DBCA 2026). The nearest wetlands listed in the Directory of Important Wetlands to the Survey Area is Lake Annean, 150 km south.

3 METHODOLOGY

3.1 DESKTOP STUDY

The desktop study provides background information on the known attributes of the Survey Area and the local surrounding area, with regards to flora and vegetation and their known habitat associations.

3.1.1 Database Searches

A search for EPBC Act MNES was undertaken using the DCCEEW Protected Matters Search Tool (PMST). The PMST identifies EPBC listed species and communities based on predicted distributions of the species and/or their habitat, in conjunction with species records. For this search, the Survey Area was imported into the PMST viewer as the feature area and a buffer of 30 km applied. The conservation codes are available through Appendix A. The results of the PMST search are included in Appendix B.

The DBCA maintains databases for records of T and P species and communities. A request was made for a search of DBCA databases for T and P flora, fauna and the presence of TECs or PECs. A 30 km buffer was applied to the search results for flora and communities as these aspects are well surveyed in the area. A 50 km buffer was applied to fauna as records in the area are infrequent. Due to the infrequency of fauna records, searches were also made of the Atlas of Living Australia (ALA, 2026) database with a buffer of 50 km.

Flora inventory, including records for Introduced flora from within 30 km, were obtained from the Dandjoo Biodiversity Data Repository hosted by the DBCA Biodiversity Office (DBCA 2026a).

Table 3-1 lists the database searches conducted for the desktop study.

Table 3-1. Database Searches

Attribute	Search Area	Database	Report Location
Threatened and Priority Ecological Communities	30 km radius	DBCA	Figure 4-2; Section 4.1.1
	30 km radius	PMST	Appendix A
Threatened Flora	30 km radius	DBCA	Figure 4-1; Section 4.1.1
	30 km radius	PMST	Appendix A
Threatened Fauna	50 km radius	DBCA	Figure 5-1; Section 4.1.1
	30 km radius	PMST	Appendix A
	50 km radius	ALA	Figure 5-1; Section 4.1.1
Introduced Flora	30 km radius	Dandjoo	Section 4.1.3

The DBCA fire history database (DBCA 2026b) was consulted to identify local fire history, and the BoM (2026b) Groundwater Dependent Ecosystems (GDE) Atlas was checked for the presence of potential GDE.

3.1.2 Literature Review

No flora and vegetation surveys have been conducted in the Horseshoe Survey Area previously, but a large number of surveys have been conducted nearby at the Greater Fortnum Project and Peak Hill deposit area. The following local surveys were reviewed, and the results incorporated into the Desktop Study where relevant:

- Dames and Moore (1988) Flora and Fauna Survey Fortnum Project. Prepared for Homestake Australia Limited October 1988.
- MBS Environmental (2005) *A Vertebrate Fauna Survey of the Jack Hills Project Area, Murchison Region, Western Australia*. Unpublished report for Murchison Metals Limited.
- Spectrum Ecology (2009), Forrest Mining Area Reconnaissance Flora & Level 1 Fauna Assessment, Prepared for Westgold Resources Limited.
- ecologia Environment (2009) *Jack Hills Expansion Project Vertebrate Fauna Assessment*. Unpublished Report for Crosslands Resources Ltd.
- Meissner *et al.* (2009) Flora and vegetation of the banded ironstone formation of the Yilgarn Craton: Robinson Ranges and Mount Gould;
- Umwelt (2012) Level 1 Flora and Vegetation Survey and Creek Vegetation Condition Assessment. Prepared for Grosvenor Gold Pty Ltd November 2012.
- Maia (2016a) Level 1 Flora and Vegetation Reconnaissance and Targeted Flora Survey Labouchere. Prepared for Metals X September 2016.
- Maia (2016b) Level 1 Flora and Vegetation Reconnaissance and Targeted Flora Survey Nathans Survey Area. Prepared for Metals X November 2016.
- APM (2024) *Stenanthemum mediale* Targeted Search Labouchere Area. Prepared for Westgold Resources September 2024.
- APM (2025) Night Parrot Desktop Study Labouchere Nathans Area. Prepared for Westgold Resources August 2025.

3.1.3 Likelihood of Occurrence

Threatened and Priority flora and communities returned from the database searches and literature review were assessed for their likelihood of occurrence within the Survey Area using the likelihood of occurrence criteria listed in Table 3-2.

Table 3-2. Likelihood of occurrence criteria

Likelihood of Occurrence	Criteria
Recorded	Identified from database records or field survey as occurring within the Survey Area
Likely	Suitable habitat is present in the Survey Area and the species has previously been recorded within 15 km

Possible	Suitable habitat is present within the Survey Area and the species has previously been recorded more than 15 km from the Survey Area but within 30 km (flora) or 50 km (fauna)
Unlikely	No suitable habitat is present in the Survey Area

3.2 FIELD SURVEY

3.2.1 Survey Personnel and Timing

The survey was carried out in two periods – the 31st March 2026 and from the 8th to 10th of May 2026 by Dr Mitchell Ladyman and Dr Neil Pettit. Drs Ladyman and Pettit have 25 years and 40 years industry experience respectively.

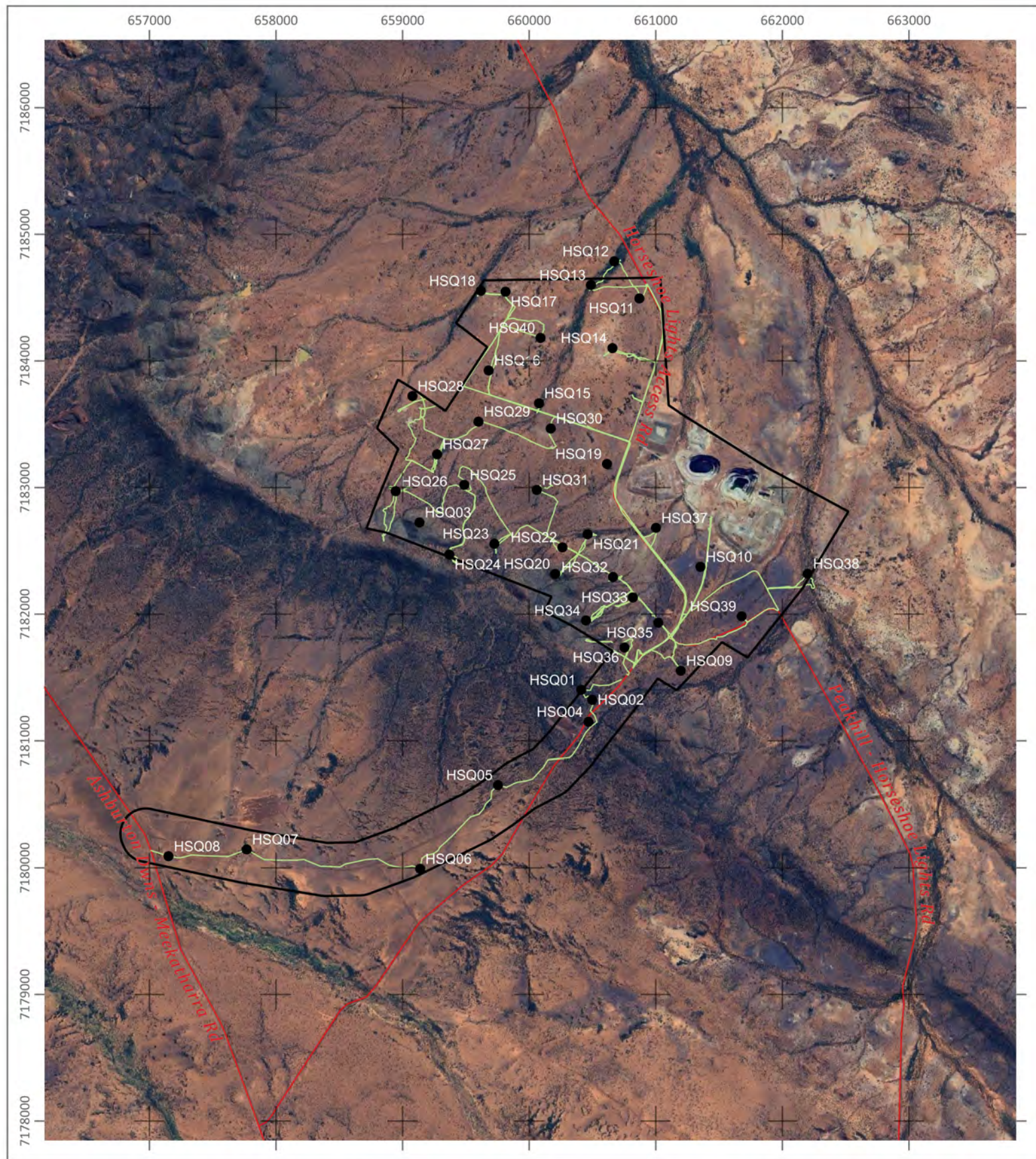
3.2.2 Survey Conditions

The total summer rainfall prior to survey (January to April) was below average at 18.2 mm compared to the long-term average for the same period of 108.5 mm (BoM 2024). The median rainfall over the same period is 54.2 mm and therefore the 2026 total was very low compared to the long term rainfall. Survey conditions were adequate for perennial woody species but constrained for herbaceous and short lived perennial species.

The Survey Area is within the Eremaean botanical province. Recommended timing for flora and vegetation survey is 6 to 8 weeks post wet season (March to June) for Primary survey, and a Dry season survey (after winter rainfall if available) for Supplementary survey (EPA 2016). The timing of the field survey is within the Primary survey period recommended for flora and vegetation in the region.

3.2.3 Flora and Vegetation

A Detailed survey was conducted for flora and vegetation. Vegetation was sampled using 40 quadrats of 20 x 20 m (Figure 3-1). Quadrats are vegetation survey plots which are accurately measured out as 20 x 20 m (or an area equivalent to 400 m²) and marked at each corner using a handheld Global Positioning System (GPS) unit.



Author: EH Date: 19/07/2026

Flora and Vegetation Survey Sites

Prepared for:

WESTGOLD

Scale: @ A4 1: 40,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

Figure 3-1

Legend

- Horseshoe Survey Area
- Flora and Vegetation Detailed Sites
- Targeted Search tracklogs



Field data at each survey site was recorded on a pro-forma data sheet and included the parameters listed in Table 3-3. The attributes of Detailed survey sites are provided in Appendix C.

Table 3-3. Parameters recorded at each Detailed site

Variable	Parameters
Collection attributes	Personnel/recorder; date, quadrat dimensions and marking method, site code and georeferenced photographs of the quadrat.
Physical features	Landform, slope, aspect, soil attributes, ground surface cover, litter, rock type and physical attributes.
Location	Coordinates recorded using a hand-held GPS (Garmin) to accuracy approximately ± 5 m.
Vegetation	Dominant growth form, height, cover, and species for the three traditional strata (upper, mid and ground) compatible with NVIS Level V (ESCAVI 2003).
Vegetation condition	Vegetation condition was assessed using the condition rating scale devised by Trudgen (1988).
Disturbance	Level and nature of disturbances (<i>e.g.</i> weed presence, fire, and time since last fire, impacts from grazing, vegetation clearing, erosion).
Flora	List of all species within the quadrat including weeds and listing species average height and cover.

A flora inventory was compiled from taxa listed in Detailed survey sites and from opportunistic floristic collections throughout the Survey Area, with at least one collection made for every taxon encountered. Specimens were identified by an experienced botanical taxonomist in the Western Australia Herbarium using published reference material. The nomenclature applied is consistent with Florabase (Western Australia Herbarium 1998-).

The conservation status of all recorded flora was determined from the DBCA List of T and P flora (DBCA 2026c), and the EPBC Act List of T Flora (DCCEEW 2026). The Western Australian Organisms List database was consulted to determine if any are BAM Act Declared Plants (DPIRD 2026).

The vegetation types were described based on their structure and species composition, as defined by quadrat data, and field observations. Vegetation was mapped in the field using handheld GPS units and aerial photographs, then digitised using GIS software. Vegetation is described at the association level (ESCAVI 2003) and referred to as Vegetation Types (EPA 2016).

Vegetation Condition was assigned using the scale developed for the Eremaean and Northern Botanical Provinces adapted from Trudgen (1988) as recommended in EPA (2016).

Table 3-4 lists the six potential categories.

Table 3-4. Vegetation Condition Scale

Vegetation Condition	Erreanean and Northern Botanical Provinces adapted from Trudgen (1988)
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement
Very Good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; <i>i.e.</i> areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs

Data analysis was applied through the preparation of a species by site matrix using the complete suite of species recorded. The Primer 7 (Clarke and Gorley, 2015), software was used to perform floristic composition vegetation classification. A species accumulation routine was used to assess whether the survey provided a reasonable representation of the species that may have been expected to occur at the Survey Area. Quadrat species abundance data was used for all multivariate analysis, with square root transformation applied. A cluster analysis was also calculated to group quadrat sites according to their floristic similarities (Clarke and Gorley 2015). The subsequent groups were used to subjectively map the vegetation within each Survey Area according to the spatial spread of the surveyed quadrats concurring with the different vegetation communities developed. To compare the floristics of the quadrats within the Survey Area with the plant communities recorded for the nearby BIF of the Robinson Range, a multi-dimensional scaling (MDS) ordination routine was used, comparing the surveyed quadrats with data from three Robinson Range PEC vegetation types as described by Meissner *et al.* (2009).

Targeted search for conservation significant flora was made during traverses on foot, however this was limited to traverses between quadrats. Systematic targeted search was not performed across all suitable habitats due to limitations in seasonal conditions.

3.2.4 Fauna

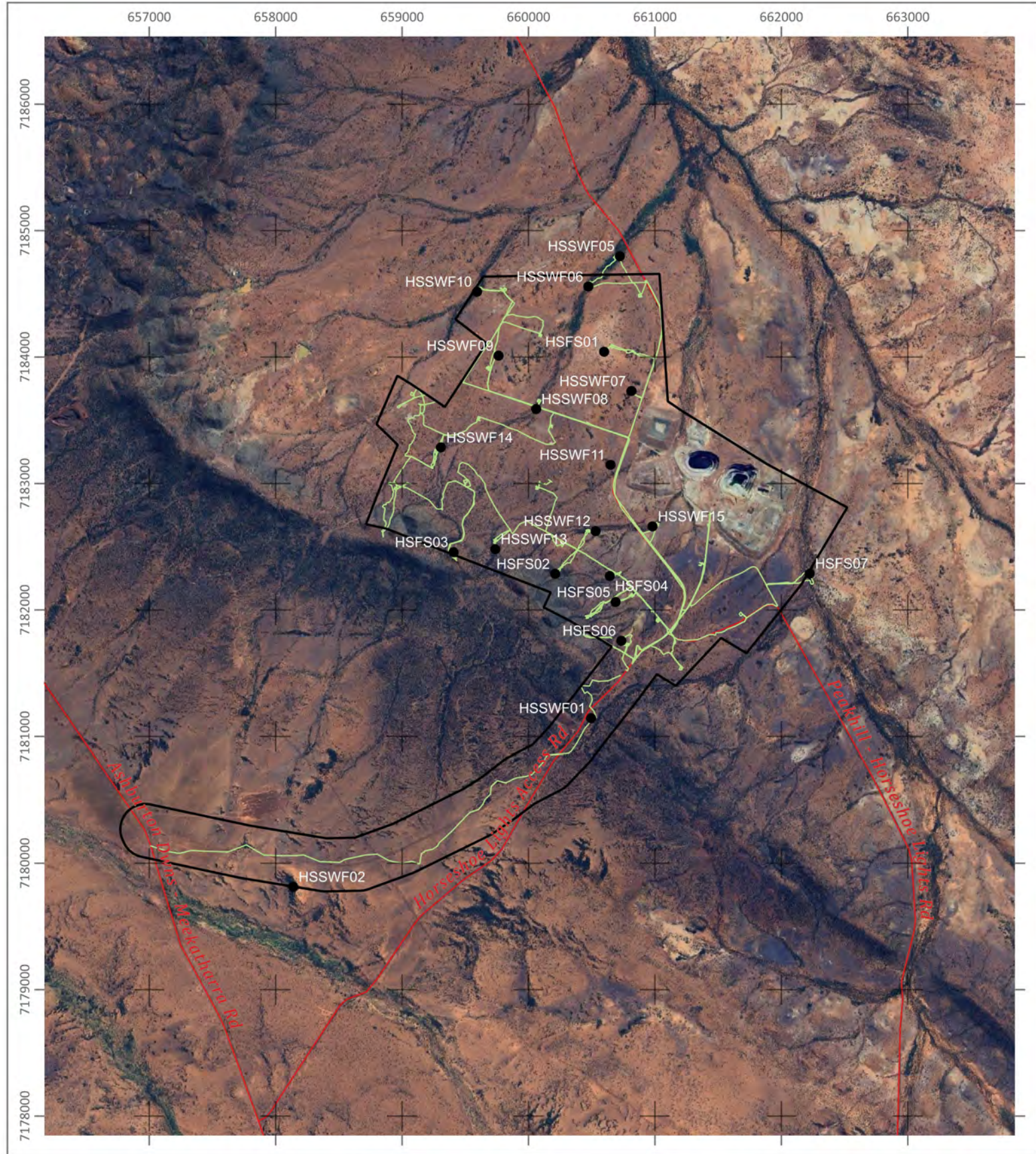
A Basic survey was conducted to verify the overall adequacy of the desktop study and to map and describe habitats. The basic survey included habitat assessments at 20 locations distributed throughout

the Survey Areas and into the surrounding reference areas that were included to verify condition. Georeferenced photos were taken at all fauna habitat assessment sites and mapping of the distribution of fauna habitats was conducted on printed maps in the field and converted to GIS layers. Habitat assessments were conducted using methodology and terminology modified from the *Australian Soil and Land Survey Field Handbook* (National Committee on Soil and Terrain, 2009). The characteristics recorded during the habitat assessments were:

- site information: location, georeferenced photo, broad habitat type, date
- landform: landform type, slope, aspect
- vegetation: leaf litter %, hollow bearing trees, broad floristic formation, vegetation structure (tall, mid and low), and dominant species
- land surface: availability of soil for burrowing, cracks or crevices for sheltering, presence of surface water bodies
- soil: texture
- substrate: bare ground, rock size, rock type, rock outcropping, and
- disturbance: time since last fire, evidence of weeds, grazing, erosion or human disturbances.

Notes were made on the availability of suitable breeding and foraging habitats for conservation significant fauna identified in the desktop study.

Targeted Search was conducted on foot during traverses to detect any suitable microhabitats, signs or evidence of the presence of conservation significant fauna. Fauna habitat assessment locations and targeted search tracklogs are shown in Figure 3-2.



Author: EH

Date: 19/07/2026

Legend

- Horseshoe Survey Area
- Fauna Survey Sites
- Targeted Search tracklogs

Fauna Survey Sites

Prepared for:

WESTGOLD

Scale: @ A4
1: 40,000



0 0.5 1 km

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator



Figure 3-2



3.3 CONSTRAINTS

Several limitations may arise during field survey EPA (2016). These potential survey limitations are listed below in Table 3-5 with comments on the constraint to the outcomes of the survey.

Table 3-5. Survey Constraints

Factor	Impact of survey outcomes
Access problems	Not a constraint. The Survey Area was accessible by vehicle. Within the Survey Area areas were traversed on foot.
Experience levels	Not a constraint. The personnel were suitably qualified.
Scope: Flora and vegetation	Not a constraint. Survey was carried out at a Detailed level of assessment.
Timing, weather, season, cycle	Significant constraint. The Survey Area is within the Eremaean Botanical district. The Flora and Vegetation survey was conducted within the recommended Primary survey period (EPA 2016). Rainfall in the season prior to survey was 17% of average or 34% of median, and conditions were observed to be dry. The observed species richness was 87.2% complete compared to the modelled expected richness (Appendix C).
Sources of information	Not a constraint. Previous biological reports and database records are available for the locality and region.
Completeness: Flora and vegetation	Not a constraint. Four plant specimens (5% of the collection) were not able to be determined to the species level due to lack of fertile material. Modelling indicates the survey captured 70-86% of the floristic richness present at the time of survey.

4 FLORA AND VEGETATION RESULTS

4.1 DESKTOP STUDY

4.1.1 Significant Flora

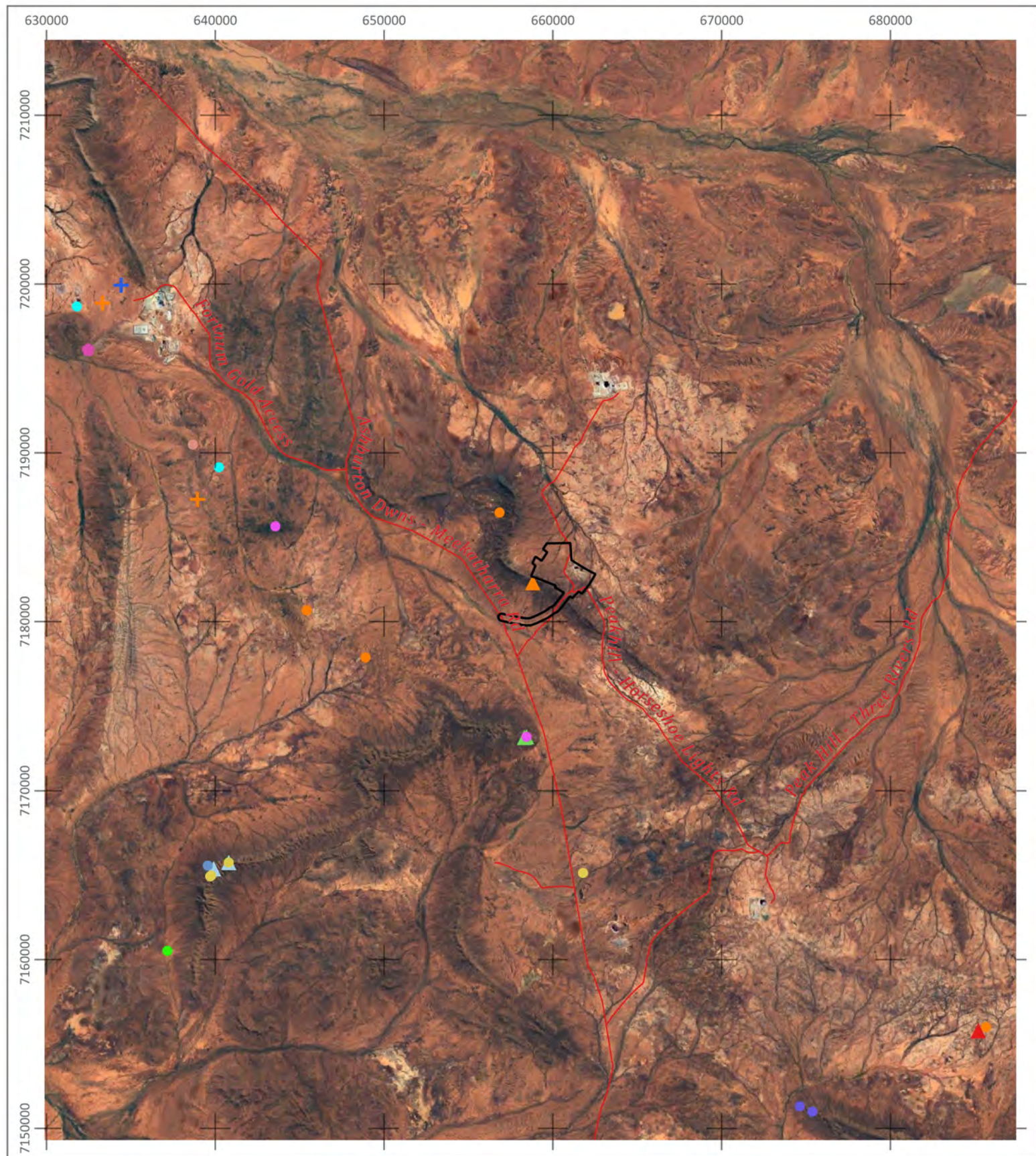
No T Flora listed under the BC Act and/or EPBC Act or flora considered P in WA have been previously recorded within the Survey Area.

One species, *Pityrodia augustensis*, listed as Vulnerable under the BC and EPBC Acts was returned from the PMST search as habitat modelling suggests the species may occur.

The database returned four P1, one P2, eight P3 and one P4 species as having previously been recorded within 30 kms of the Survey Area. An assessment of the likelihood of occurrence of these species within the Survey Area was performed using the criteria listed in Table 3-2. The results of the assessment are listed in Table 4-1, finding four species are considered likely to occur as suitable habitat is present, and existing records are within 15 km and another ten are possibly occurring as suitable habitat is present but existing records are further than 15 km away.

For nine P flora listed in Table 4-1 suitable habitat occurs in the Peak Hill Land System, which represents the banded ironstone ridge that is part of the Robinson Ranges. Whilst known record locations of *Pityrodia augustensis* are from higher elevations, the most suitable potential habitat within the Survey Area is also within the Peak Hill Land System.

Priority flora records in relation to the Survey Area are shown in Figure 4-1.



Author: EH Date: 19/07/2026

Conservation Significant Flora

Prepared for:

WESTGOLD

Scale: @ A4
1: 300,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

Figure 4-1



Legend

Horseshoe Survey Area



Eremophila prolata



Eucalyptus semota



Hibiscus sp. Perrinvale Station



Pityrodia iphthima



Indigofera fractiflexa subsp. augustensis



Eremophila lanata



Eremophila obliquisejala



Homalocalyx echinulatus



Indigofera gilesii



Maireana prosthocochaeta



Prostanthera ferricola



Sauropus sp. Woolgorong



Tribulus adelacanthus



Goodenia berringbinensis

Table 4-1. Threatened and Priority Flora Likelihood of Occurrence

Species	Cons. Code BC Act	EPBC Act	Preferred Habitat	Likelihood of Occurrence
<i>Pityrodia augustensis</i>	VU	VU	Rocky hillsides: Amongst rocks on slopes or in drainage lines.	Possible. Suitable habitat in rocky hills.
<i>Eremophila prolata</i>	P1	-	Red stony clay. Flats and rises.	Unlikely. Regionally occurring on granite geology of the Mindura Land System.
<i>Eucalyptus semota</i>	P1	-	Clay. Quartz outcrops.	Likely. Locally recorded in the Peak Hill Land System.
<i>Hibiscus sp. Perrinvale Station (J. Warden & E. Ager WB 10581)</i>	P1	-	Banded ironstone	Likely. Suitable habitat in the Peak Hill Land System.
<i>Pityrodia iphthima</i>	P1	-	Skeletal red-brown sandy loam over banded ironstone. Upper hillslopes.	Possible. Suitable habitat in the Peak Hill Land System.
<i>Indigofera fractiflexa</i> subsp. <i>augustensis</i>	P2	-	Lower elevations of Robinson Ranges and Mount Augustus	Possible. Suitable habitat in the Peak Hill Land System.
<i>Eremophila lanata</i>	P3	-	Stony red clayey sand.	Possible. Suitable habitat in the lower elevations of the Beasley and Horseshoe Land Systems.
<i>Eremophila obliquisepta</i>	P3	-	Sand. Open hardpan plains.	Possible. Suitable habitat in the Horseshoe Land System.
<i>Homalocalyx echinulatus</i>	P3	-	Laterite. Breakaways, sandstone hills.	Possible. Suitable habitat in the Peak Hill Land System.
<i>Indigofera gilesii</i>	P3	-	Pebbly loam. Amongst boulders and outcrops on hills.	Likely. Suitable habitat in the Peak Hill Land System.
<i>Maireana prosthecochaeta</i>	P3	-	Laterite. Hills, salty places.	Likely. Suitable habitat in the Peak Hill Land System.
<i>Prostanthera ferricola</i>	P3	-	Shallow red-brown skeletal sandy loam on banded ironstone, laterite, basalt or quartz. Gently inclined mid to upper slopes of hills, rocky crests, outcrops.	Possible. Suitable habitat in the Peak Hill Land System.
<i>Sauropus sp.</i> Woolgorong (M. Officer s.n. 10/8/94)	P3	-	Red sand. Plains	Possible. Suitable habitat in the Beasley Land System.
<i>Tribulus adelacanthus</i>	P3	-	Slope of banded ironstone with red brown shallow sandy loam soils	Possible. Suitable habitat in the Peak Hill Land System.
<i>Goodenia berrinbinensis</i>	P4	-	Red sandy loam. Along watercourses.	Possible. Suitable habitat in the Three Rivers Land System.

4.1.2 Significant Vegetation

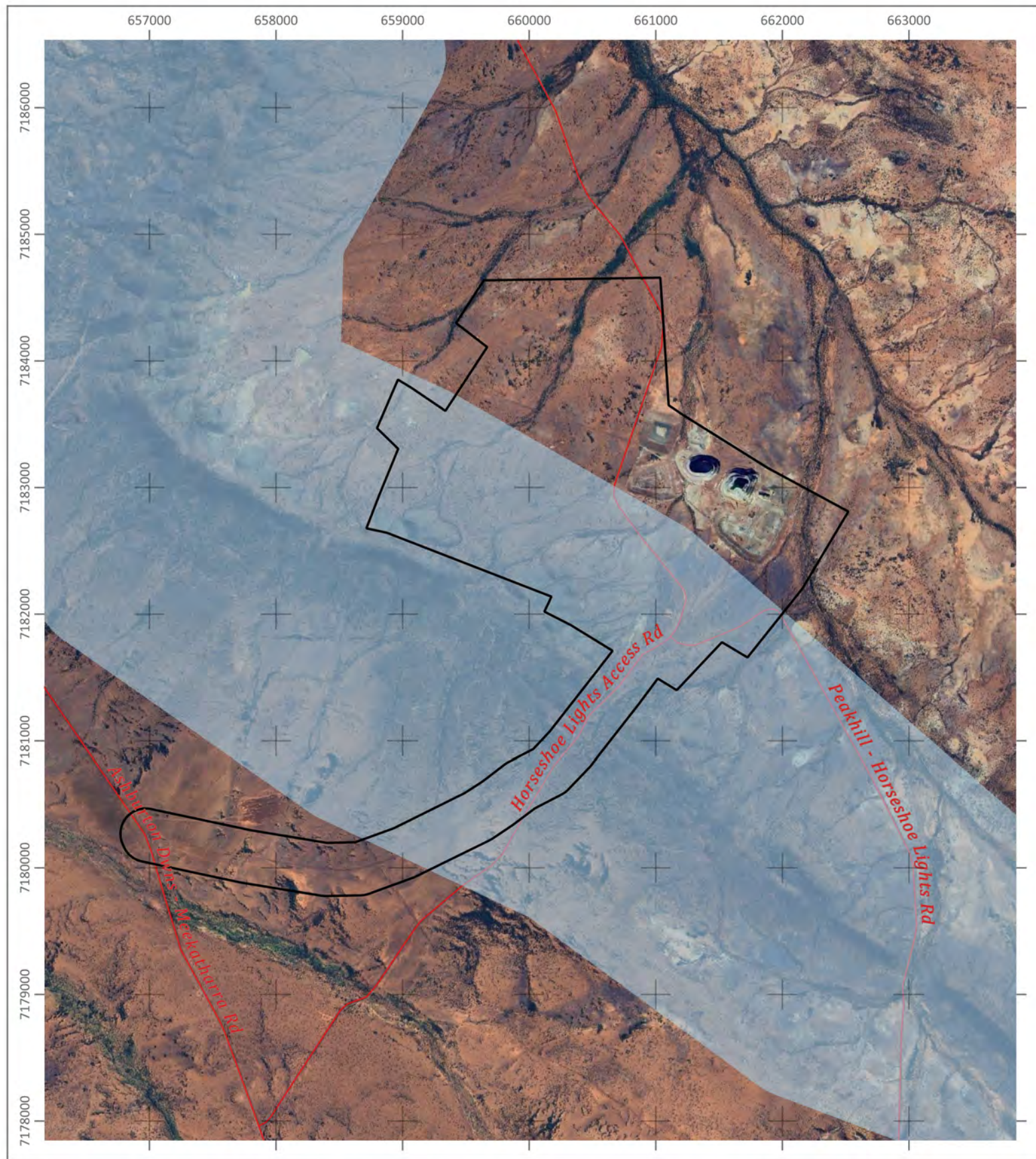
There are no TECs listed under the BC Act or EPBC Act known to occur within the Survey Area or within the local area. The DBCA database includes one P1 Ecological Community occurring within the Survey Area; the Robinson Range vegetation complexes Banded Iron Formation (Robinson Range BIF) (Figure 4-2). Robinson Range BIF was described by Meissner *et al.* (2009) who defined seven community types,

noting differences in communities were strongly correlated with soil chemistry, elevation, amount of exposed bedrock, surficial rock size and slope. The community types are described in Table 4-2.

Meissner *et al.* (2009) communities 5, 6 and 7 typify the vegetation targeted for protection in the Robinson Ranges PEC, being the vegetation types of BIF.

The extent of the PEC's shown in Figure 4-2 include a buffer allocated around the community prioritised for conservation.

Yarlarweelor Creek, within the Three Rivers Land System, has a Moderate potential for aquatic Groundwater Dependent Ecosystems in the National Assessment as shown on the GDE Atlas (BoM 2026). The Peak Hill Land System has a Low potential for terrestrial Groundwater Dependent Ecosystems in the National Assessment as shown on the GDE Atlas (BoM 2026).



Author: EH Date: 19/07/2026

Significant Vegetation

Prepared for:
WESTGOLD

Figure 4-2

Scale: @ A4
1: 40,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator



Legend

- Horseshoe Survey Area
- Robinson Range vegetation complexes (banded ironstone formation)
Priority 1 Ecological Community



Table 4-2. Vegetation communities of the Robinson Range PEC (Meissner *et al.* 2009)

Code	Landform	Description	Species richness
1	Lower slopes	Open to sparse shrublands of <i>A. aneura</i> over open to isolated shrublands of <i>Eremophila latrobei</i> subsp. <i>latrobei</i> or <i>Eremophila jucunda</i> subsp. <i>jucunda</i> , or <i>Eremophila forrestii</i> subsp. <i>forrestii</i> over <i>Ptilotus obovatus</i> var. <i>obovatus</i> and <i>Ptilotus polystachyus</i> over forbland and grassland of <i>Dysphania rhadinostachya</i> , <i>Aristida contorta</i> , <i>Eriachne pulchella</i> and <i>Goodenia tenuiloba</i> . Indicator species are <i>Dodonaea petiolaris</i> and <i>Tribulus suberosus</i> .	10.3 taxa per quadrat
2	Upper slopes and crests of Mount Gould	Isolated shrubland of <i>A. aneura</i> or <i>Grevillea berriana</i> over sparse to open shrubland of <i>Philotheca brucei</i> subsp. <i>cinerea</i> , <i>E. latrobei</i> subsp. <i>latrobei</i> over hummock grassland of <i>Triodia melvillei</i> . Indicator species <i>Corchorus crozophorifolius</i> , <i>Eriachne mucronata</i> , <i>P. brucei</i> subsp. <i>cinerea</i> , <i>Sida</i> sp. <i>tiny green fruits</i> (S. van Leeuwen 2260) and <i>T. melvillei</i> .	12 taxa per quadrat.
3	Lower slopes and colluvial outwash	Sparse shrubland and woodlands of <i>A. aneura</i> and <i>Acacia pruinocarpa</i> over shrubland of <i>A. aneura</i> (juvenile), <i>A. ramulosa</i> var. <i>linophylla</i> , <i>Eremophila fraseri</i> , <i>Eremophila spectabilis</i> subsp. <i>spectabilis</i> and <i>Senna glaucifolia</i> over forbland and grassland of <i>P. polystachyus</i> , <i>E. pulchella</i> and <i>Paspalidium basicladum</i> . Indicator species are <i>Hibiscus</i> aff. <i>burtonii</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>E. spectabilis</i> subsp. <i>spectabilis</i> , <i>A. aneura</i> var. <i>aneura/intermedia</i> morphotype, <i>A. tetragonophylla</i> and <i>Senna</i> sp. Meekatharra (E. Bailey 1–26).	11 taxa per quadrat
4	Slopes and crests on banded ironstone	Open to sparse shrubland of <i>A. aneura</i> over open to isolated shrubland of <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> , <i>Eremophila punctata</i> , <i>E. exilifolia</i> , <i>E. jucunda</i> subsp. <i>jucunda</i> , <i>E. spectabilis</i> subsp. <i>spectabilis</i> and <i>E. forrestii</i> subsp. <i>forrestii</i> over forbland and grassland of <i>Eriachne pulchella</i> , <i>P. basicladum</i> , <i>P. polystachyus</i> and <i>Sida</i> sp. golden calyces glabrous (H.N. Foote 32). Indicator species were <i>E. jucunda</i> subsp. <i>jucunda</i> and <i>E. punctata</i> .	14.1 taxa per quadrat.
5	Outcrops of banded ironstone	Open to sparse shrubland of <i>A. aneura</i> , <i>Acacia citrinoviridis</i> , <i>Corymbia ferriticola</i> subsp. <i>ferriticola</i> over <i>E. latrobei</i> subsp. <i>latrobei</i> , <i>E. exilifolia</i> , <i>E. punctata</i> , <i>E. jucunda</i> subsp. <i>jucunda</i> , <i>Eremophila pendulina</i> and <i>E. forrestii</i> subsp. <i>forrestii</i> , <i>P. obovatus</i> var. <i>obovatus</i> , <i>S. chrysocalyx</i> , <i>Ptilotus schwartzii</i> over grasslands of <i>P. basicladum</i> and <i>Eriachne pulchella</i> . Indicator species are <i>P. schwartzii</i> , <i>C. ferriticola</i> subsp. <i>ferriticola</i> and <i>Dodonaea pachyneura</i> .	13.7 taxa per quadrat.
6	Very rocky to slightly rocky crests and mislopes of banded ironstone	Open to sparse shrubland of <i>A. aneura</i> , <i>A. citrinoviridis</i> over open to sparse shrubland of <i>E. latrobei</i> subsp. <i>latrobei</i> and/or <i>E. exilifolia</i> and/or <i>E. jucunda</i> subsp. <i>jucunda</i> , <i>S. glaucifolia</i> and <i>Sida</i> sp. <i>Golden calyces glabrous</i> (H.N. Foote 32) over grassland of <i>E. pulchella</i> and <i>P. basicladum</i> . Indicator species are <i>P. schwartzii</i> , <i>Indigofera fractiflexa</i> subsp. Mt. Augustus (S. Patrick & A. Crawford SP4734), <i>E. jucunda</i> subsp. <i>jucunda</i> , <i>Senna glutinosa</i> subsp. <i>pruinosa</i> and <i>E. exilifolia</i> .	10.2 taxa per quadrat.
7	Restricted to the upper slopes and crests of Mount Fraser	Sparse to open shrubland of <i>A. aneura</i> and <i>A. citrinoviridis</i> over sparse to open shrubland of <i>P. brucei</i> subsp. <i>cinerea</i> , <i>Eremophila pendulina</i> , <i>Prostanthera ferricola</i> , <i>Pityrodia iphthima</i> over shrubland and hummock grassland of <i>T. melvillei</i> , <i>Amphipogon sericeus</i> and <i>P. obovatus</i> var. <i>obovatus</i> . Indicator species are <i>P. schwartzii</i> , <i>E. pendulina</i> , <i>Hibbertia arcuata</i> , <i>A. sericeus</i> , <i>P. ferricola</i> , <i>Psydrax suaveolens</i> , <i>P. brucei</i> subsp. <i>cinerea</i> and <i>T. melvillei</i>	11.3 taxa per quadrat

4.1.3 Introduced Flora Species

Dandjoo returned five introduced flora species. Studies in the literature review recorded one introduced flora species, *Bidens bipinnata*.

Table 4-3 lists the introduced flora species returned from the database, and from the literature review, noting the listing category under the BAM Act.

Table 4-3. Introduced Flora Records within 30 km of the Survey Area

Species	Common Name	BAM Act Listing	WONS
<i>Atriplex canescens</i>	-	Permitted – S11	No
<i>Bidens bipinnata</i>	Bipinnate Beggartick	Permitted – S11	No
<i>Cuscuta epithymum</i>	Lesser Dodder	Permitted – S11	No
<i>Datura leichhardtii</i> Benth. subsp. <i>leichhardtii</i>	Thornapple	Permitted – S11	No
<i>Heliotropium europaeum</i>	Common Heliotrope	Permitted – S11	No
<i>Vachellia farnesiana</i>	Mimosa Bush	Permitted – S11	No

There are no records of Declared weeds known from the local area.

4.2 FIELD SURVEY

4.2.1 Flora

Within the 40 quadrats surveyed a total of 81 species from 25 families and 36 genera were identified. The most common families were Fabaceae (25 taxa), Scrophulariaceae (13 taxa) and Chenopodiaceae (8 taxa). *Acacia*, *Eremophila* and *Senna* were the most frequent genera (17, 13 and 7 respectively). There was an average of 10.7 taxa recorded per quadrat with a range of 4-18 taxa per quadrat.

Two specimens in the collection (2.5% of the collection) could not be unambiguously identified beyond genus level due to the lack of flowering parts or fruiting bodies.

The complete list of plant species recorded within the Survey Area is presented in Appendix D. Comparison of floristic richness recorded in surveys at the nearby Greater Fortnum Project indicate species richness was within the range previously recorded being higher than that recorded by Umwelt (2013) who recorded 66 taxa from 15 families and 31 genera and less than Meissner *et al.* (2009) recorded 165 taxa across a much broader spatial area encompassing the entire Robinson Ranges and Mount Gould. Average species richness per quadrat was within the range recorded by Meissner *et al.* (2009) which ranged from 10.2 to 14.1. The species richness of the Survey Area is at the lower end of that recorded by Meissner *et al.* (2009).

The species accumulation curve (Appendix C) indicated that the survey provided a reasonable representation of the species that may have been expected to occur at the sites (87%). The survey took place in March and May under dry conditions and some annual species that are expected to occur were not present. Meissner *et al.* (2009) note grasses as dominating annual flora following summer rains and

Asteraceae annuals being more prevalent following winter rains. No Asteraceae were recorded and three species of grass were recorded in low frequency and abundance. Comparison to previous surveys is therefore based upon perennial flora as recommended by EPA (2016).

One specimen was collected that may be the priority species *Indigofera gilesii* (P3) however the condition was unsuitable for complete taxonomic determination. No weeds were recorded during the survey.

Floristic groups identified in the cluster analysis (Appendix C) were organised into vegetation types and are discussed in the following section, followed by discussion of vegetation condition. Priority and introduced flora are detailed in Sections 4.2.4 and 4.2.6.

4.2.2 Vegetation Types

Six broad communities were identified from the Cluster analysis with two of these further subdivided to given a total of eight vegetation types (Figure 4-3). Changes in species composition were subtle with larger differences notable in the density of vegetation. Changes in density were noticeable from the broad, flat stony hardpan plain that made up the bulk of the study area (VT1, VT2 and VT5), to the rocky areas of the lower and toe-slopes of the banded ironstone range that runs parallel to the southern border of the Survey Area. The remaining vegetation types were either associated with the crests and upper slopes of the residual banded ironstone range (VT4) or were associated with the minor (VT6a) or larger (VT6b) drainage lines.

Following the approach of Meissner et al. (2009), environmental factors described for each quadrat including landform, soils and rock types were incorporated into the analysis to understand how the vegetation types correlate with the landscape. Vegetation types described for the Survey Area are summarised in Table 4-4 and detailed below.

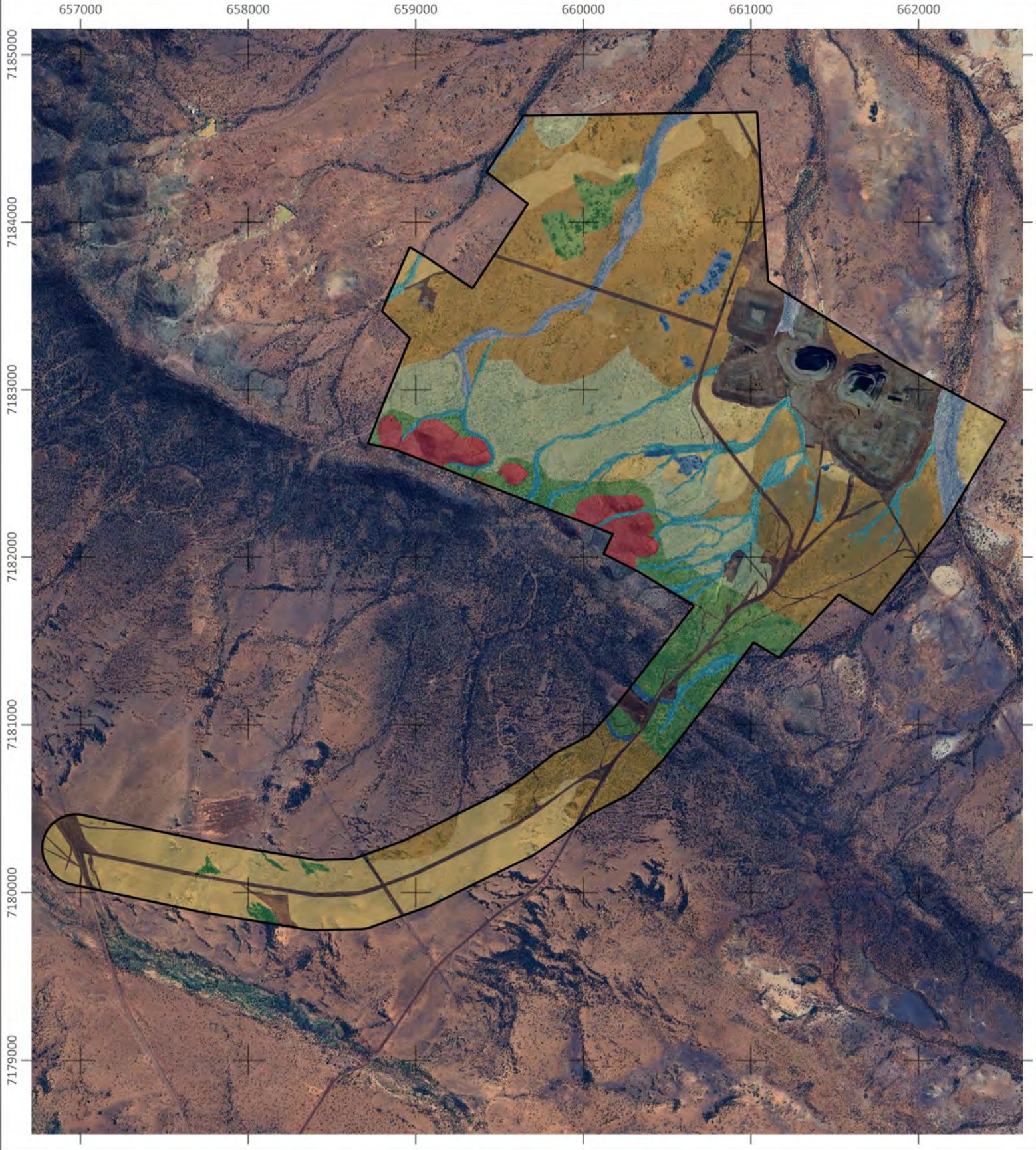
Table 4-4 Vegetation Types

Code	Landform	Vegetation Description	ha	%
VT1	Stony ironstone plains	Sparse overstorey of <i>Acacia aptaneura</i> with some <i>A. rhodophloia</i> and <i>A. pruinocarpa</i> over very sparse low shrublands of <i>Eremophila compacta</i> , <i>Ptilotus obovatus</i> and <i>Ptilotus schwartzii</i>	297.3	33.8
VT2	Run-on areas	Low woodland of <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over sparse mid shrubs of <i>Psydrax rigidula</i> , <i>Psydrax latifolia</i> and <i>Eremophila galeata</i> over sparse low shrubs of <i>Eremophila spectabilis</i> , <i>Sida ectogama</i> and <i>Rhagodia eremaea</i> .	8.1	0.9
VT3a	Stony toe-slopes	Low open woodland of <i>Acacia aptaneura</i> over sparse tall shrubland of <i>Acacia citrinoviridis</i> , <i>Grevillea berryana</i> and <i>Acacia tetragonophylla</i> over sparse low shrubs of <i>Eremophila spectabilis</i> , <i>Senna artemisioides</i> subsp. <i>sturtii</i> and <i>Senna glutinosa</i> subsp. <i>luerssenii</i> .	75.3	8.6
VT3b	Gravelly lower slopes	<i>Acacia aptaneura</i> low open woodland over sparse tall <i>Acacia cuthbertsonii</i> and <i>Acacia tetragonophylla</i> over sparse low shrubland of <i>Eremophila spectabilis</i> and <i>Senna artemisioides</i> subsp. <i>sturtii</i> .	110.1	12.5
VT4	Crests and upper slopes of	Low sparse woodland of <i>Acacia rhodophloia</i> and <i>Acacia aptaneura</i> over low open shrubland of <i>Tribulus suberosus</i> , <i>Eremophila galeata</i> and <i>Euploca ovalifolia</i> .	26.9	3.1

Code	Landform	Vegetation Description	ha	%
	eroded ironstone			
VT5	Hardpan plains	Isolated low <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over isolated tall shrubs of <i>Acacia rhodophloia</i> , <i>Grevillea berryana</i> and <i>Acacia tetragonophylla</i> over low open shrubland of <i>Eremophila spathulata</i> , <i>Eremophila compacta</i> and <i>Ptilotus rotundifolius</i> .	156.6	17.8
VT6a	Minor drainage lines	Low woodland of <i>Acacia aptaneura</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia cuthbertsonii</i> over mid open shrubland of <i>Acacia tetragonophylla</i> , <i>Scaevola spinescens</i> and <i>Acacia aneura</i> over sparse low chenopod shrubland of <i>Scleroleana cuneata</i> , <i>Mariana triptera</i> and <i>Tecticornia doleiformis</i> .	37.8	4.3
VT6b	Larger drainage lines	Low woodland of <i>Acacia cyperophylla</i> , <i>Acacia aptaneura</i> ± <i>Eucalyptus victrix</i> over sparse tall shrubland of <i>Acacia kempeana</i> , <i>Acacia tetragonophylla</i> and <i>Psyrax latifolia</i> over low shrubs of <i>Eremophila galeata</i> and <i>Sida ectogama</i> with sparse tussock grasses of <i>Cymbopogon obtectus</i> .	29.5	3.4
D	-	Disturbed – clear of vegetation	138.4	15.7

The DBCA fire history database does not include any records of fire within the Survey Area.

Distribution of vegetation types at a scale of 1: 30,000 is shown in Figure 4-3. The dendrogram resulting from the cluster analysis is shown in Appendix C, followed by the site data sheets and photos.



Author: EH Date: 26/07/2026

Vegetation of the Survey Area

Prepared for:
WESTGOLD

Scale: @ A4
1: 30,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

Figure 4-3

Legend

- Horseshoe Survey Area
- VT1 Stony Ironstone Plains
- VT2 Run-on Areas
- VT3a Stony Toe-slopes
- VT3b Gravelly Lower Slopes
- VT4 Crests and upper slopes of eroded ironstone
- VT5 Hardpan Plains
- VT6a Minor Drainage Lines
- VT6b Larger Drainage Lines
- Disturbed



Landform: Stony ironstone plains**Vegetation Type: 1**

Low open woodland of *Acacia aptaneura*, *Acacia pruinocarpa* and *Acacia rhodophloia* and over sparse low shrublands of *Eremophila compacta*, *Ptilotus obovatus* and *Ptilotus schwartzii*.

This vegetation type occurs on stony flats in the lower area of the landscape and generally consisted of loamy soils with a predominance of ironstone rock type.

Isolated mid shrubs of *Eremophila jucunda* subsp. *juncunda*, *Eremophila latrobei*, *Eremophila spathulata*, *Eremophila compacta* and *Eremophila spectabilis* are sometimes present.



Plate 4-1. Stony ironstone plains

Condition: The condition of this vegetation is Good. Common disturbances are frequent tracks, off track driving and exploration activity including rehabilitated drill pads with poor revegetation success.

Detailed sites: HSQ5, HSQ14, HSQ16, HSQ24, HSQ29, HSQ30, HSQ39

Total richness: 24 species. Average richness: 8.3 species.

Introduced/exotic taxa: None

Conservation significant species: None

Landform: Run-on areas**Vegetation Type: 2**

Low woodland of *Acacia aptaneura* and *Acacia pruinocarpa* over sparse mid shrubs of *Psydrax rigidula*, *Psydrax latifolia* and *Eremophila galeata* over sparse low shrubs of *Eremophila spectabilis*, *Sida ectogama* and *Rhagodia eremaea*.

This group occurs on run-on areas of the stony plain sometimes adjacent to minor drainage lines. Soils tended to be loam to clay with rounded rocks of mixed origin. This plant community was generally very similar to the surrounding plains but with higher tree density and foliage cover, due the higher moisture levels.

Ptilotus obovatus, *Senna artemisioides* subsp. *helmsii* and *Senna glutinosa* subsp. *chatelainiana* were also common.



Plate 4-2. Run-on areas

Condition: The condition of this vegetation is Good. Disturbances included grazing from cattle and feral herbivores, and occasional tracks.

Detailed sites: HSQ4, HSQ19, HSQ21, HSQ23.

Total richness: 29 species.

Average richness: 15.3 species.

Introduced/exotic taxa: none

Conservation significant species: A specimen was collected at HSQ4 that could not be identified to species level but that showed some similarity to *Indigofera gilesii* (P3). The taxa was recorded as sparsely occurring within the quadrat.

Landform: Stony toe slopes

Vegetation Type: 3a

Low open woodland of *Acacia aptaneura* over sparse tall shrubland of *Acacia citrinoviridis*, *Grevillea berryana* and *Acacia tetragonophylla* over sparse low shrubs of *Eremophila spectabilis*, *Senna artemisioides* subsp. *sturtii* and *S. glutinosa* subsp. *luerssenii*.

This vegetation type occurs on rocky angular stony quartzite and ironstone toe slopes with colluvial sandy loam soils with high rock cover.

Other common species included *Ptilotus obovatus*, *Eremophila galeata*, *Psydrax rigidula*, *Solanum lasiophyllum* and *Eremophila latrobei*.

Quadrat HSQ1 was included in this group under the cluster analysis (Appendix C), however some significant differences between HSQ1 and other quadrats in this group include the landform and presence of indicator species for the Robinson Ranges PEC. HSQ1 occurred on a small outcrop within the Access Road Buffer, on the southern fall of the range, whereas the rest of this vegetation type

occurred on the toe slopes and without outcropping. HSQ1 hosted the three indicator species indicated by Meissner et al (2009) for Robinson Ranges PEC Community 5, whereas these three indicator species were absent from all other quadrats within this group. The outcrop at HSQ1 is discussed further in Section 4.2.5. In Figure 4-3 the location is mapped within VT3a as indicated by the cluster analysis.



Plate 4-3. Stony toe slopes

Condition: The condition of this vegetation ranges from Good to Poor. Disturbances include impacts from nearby infrastructure such as roads and bunds, frequent tracks and over grazing from cattle and feral herbivores.

Detailed sites: HSQ1, HSQ2, HSQ7, HSQ9, HSQ34, HSQ36, HSQ40

Total richness: 29 species.

Average richness: 12.6 species.

Introduced/exotic taxa: none

Conservation significant species: *Eremophila obliquisejala* (P3) was recorded at HSQ7 at low density and a specimen was collected at HSQ34 that has been provisionally identified as *Indigofera ?gilesii* (?P3). The specimen was in poor condition and taxonomic determination is uncertain. The small outcrop at HSQ1 is potentially suitable for a range of conservation significant flora that prefer ironstone outcropping.

Landform: Gravelly lower slopes

Vegetation Type: 3b

Acacia aptaneura low open woodland over sparse tall *Acacia cuthbertsonii* and *Acacia tetragonophylla* over sparse low shrubland of *Eremophila spectabilis* and *Senna artemisioides* subsp. *sturtii*.

This vegetation type occurs on gravelly to rocky lower slopes. The soils are generally loams to loamy sand with a high density of angular residual ironstone and quartzite.

Acacia craspedocarpa, *Hakea preissii*, *Acacia marramamba*, *Grevillea berryana* and *Eremophila latrobei* are sometimes present in the midstory.



Plate 4-4. Gravelly lower slopes

Condition: The condition of this vegetation is Good. Disturbances include frequent tracks and some clearing, and grazing by cattle.

Detailed sites: HSQ6, HSQ17, HSQ25, HSQ26, HSQ31, HSQ32, HSQ35

Total richness: 29 species. Average richness: 9.4 species.

Introduced/exotic taxa: none

Conservation significant species: none

Landform: Crests and upper slopes of eroded ironstone

Vegetation Type: 4

Low sparse woodland of *Acacia rhodophloia* and *Acacia aptaneura* over low open shrubland of *Tribulus suberosus*, *Eremophila galeata* and *Euploca ovalifolia*.

This vegetation type occurs on hilltops and upslopes of the outlier residuals of the adjacent banded ironstone range that runs adjacent to the southern boundary of the Survey Area

Ptilotus obovatus, *Senna artemisioides* subsp. *helmsii* and *Senna artemisioides* subsp. *x sturtii* were also common.



Plate 4-5. Crests and upper slopes of eroded ironstone

Condition: The condition of this vegetation is Very Good.

Detailed sites: HSQ3, HSQ20

Total richness: 29 species. Average richness: 8.5 species.

Introduced/exotic taxa: none

Conservation significant species: no T or P species recorded but includes two of three indicator species for Robinson Ranges PEC Community 5 (Meissner et al. 2009). This is discussed further in Section 4.2.5. This vegetation type is potentially suitable for several conservation significant flora that prefer ironstone outcropping, identified in Table 4-1 as having a preference for the Peak Hill Land System.

Landform: Hardpan plains

Vegetation Type: 5

Isolated low *Acacia aptaneura* and *Acacia pruinocarpa* over isolated tall shrubs of *Acacia rhodophloia*, *Grevillea berryana* and *Acacia tetragonophylla* over low open shrubland of *Eremophila spathulata*, *E. compacta* and *Ptilotus rotundifolius*.

This vegetation type occurs on hardpan plain with loamy soils often with angular rocky quartzite.



Plate 4-6. Hardpan plains

Condition: The condition of this vegetation is Poor to Good. Disturbances include rehabilitation of cleared areas with poor vegetation establishment, frequent tracks and cattle grazing.

Detailed sites: HSQ8, HSQ11, HSQ22, HSQ28.

Total richness: 29 species.

Average richness: 7.5 species.

Introduced/exotic taxa: none

Conservation significant species: *Eremophila obliquisejala* (P3) was recorded at low density in HSQ8. Potentially suitable habitat for *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (P3).

Landform: Minor drainage lines

Vegetation Type: 6a

Low woodland of *Acacia aptaneura*, *Acacia sclerosperma* subsp. *sclerosperma* and *Acacia cuthbertsonii* over mid open shrubland of *Acacia tetragonophylla*, *Scaevola spinescens* and *Acacia aneura* over sparse low chenopod shrubland of *Scleroleana cuneata*, *Mariana triptera* and *Tecticornia doleiformis*.

These minor drainage lines and adjacent areas are moisture gaining with clay loam soils and minimal rock coverage.

Senna artemisoides subsp. *x sturtii*, *Senna glutinosa* subsp. *x luerssenii* and *Ptilotus obovatus* were also common.



Plate 4-7. Minor drainage lines

Condition: The condition of this vegetation is Poor to Good. Disturbances include cattle grazing and frequent tracks.

Detailed sites: HSQ10, HSQ33, HSQ37

Total richness: 29 species.

Average richness: 13.3 species.

Introduced/exotic taxa: none

Conservation significant species: none recorded.

Landform: Larger drainage lines

Vegetation Type: 6b

Low woodland of *Acacia cyperophylla*, *Acacia aptaneura* ± *Eucalyptus victrix* over sparse tall shrubland of *Acacia kempeana*, *Acacia tetragonophylla* and *Psyrax latifolia* over low shrubs of *Eremophila galeata* and *Sida ectogama* with sparse tussock grasses of *Cymbopogon obtectus*.

These larger drainage lines and adjacent areas are moisture gaining with clay loam soils on the riparian banks with sandy soils and patchy dense rounded alluvial rock and boulder cover of mixed origin.



Plate 4-8. Larger drainage lines

Condition: The condition of this vegetation is Good. Disturbances include cattle grazing and frequent tracks.

Detailed sites: HSQ12, HSQ13, HSQ15, HSQ18, HSQ27, HSQ38

Total richness: 29 species.

Average richness: 11.2 species.

Introduced/exotic taxa: none

Conservation significant species: None recorded. Potentially suitable habitat for *Goodenia berringbinensis* (P4)

4.2.3 Vegetation Condition

Vegetation condition across the Survey Area ranged from Completely Degraded in areas that are currently used for mining or pastoral activities, to Very Good Condition on the elevated outcrop areas. The largest portion of the Survey Area was in Good Condition (Table 4-5; Figure 4-4).

Table 4-5. Vegetation condition within the Survey Area

Vegetation Condition	Area (ha)	Proportion (%)
Very Good	26.9	3.1
Good	545.8	62.0
Poor	168.8	19.2
Completely Degraded	138.4	15.7

The primary sources of disturbance on-site are frequent tracks and clearing for historic and current mining and mining exploration coupled with moderate to high grazing impact from cattle and introduced feral herbivores. A fine layer of dust was present near roads and other cleared areas.

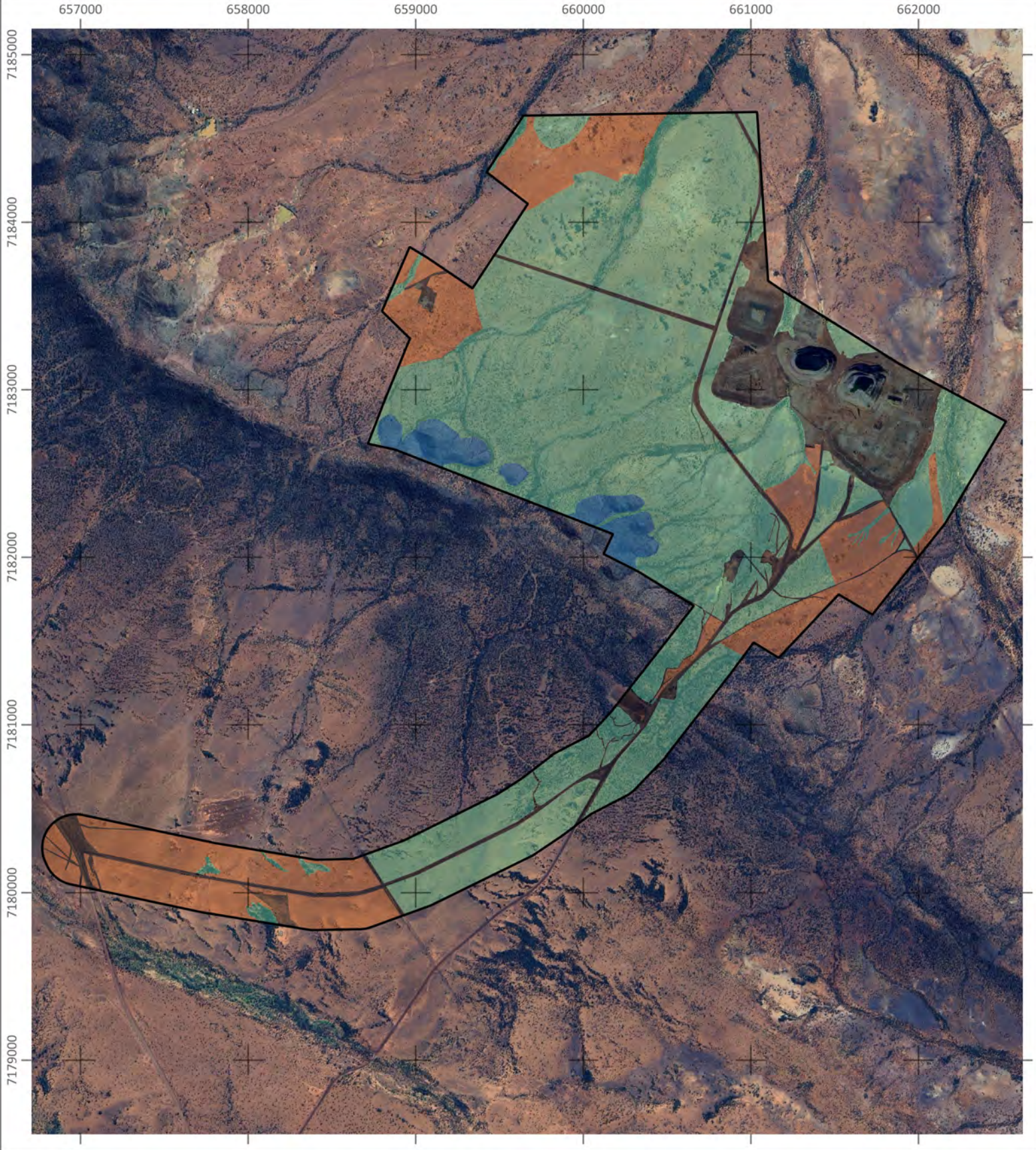
The Survey Area is not within a Pastoral Station however cattle evidence was frequent and cattle were seen frequently around the site.

Areas receiving a condition rating of Very Good had no evidence of grazing activity, no tracks or clearing and litter layers were present.

Areas receiving a condition rating of Good had a low to moderate level of grazing activity and frequent tracks/recent and historic clearing is present.

Areas receiving a condition rating of Poor had a moderate to high level of grazing activity and frequent tracks/recent and historic clearing is present.

Areas classified as Completely Degraded are cleared of vegetation and either maintained in a vegetation free state or areas of ripped rehabilitation that have had low success with vegetation reestablishment.



Author: EH Date: 26/07/2026

Vegetation Condition

Prepared for:
WESTGOLD
 Scale: @ A4
 1: 30,000
 Coordinate System: GDA 2020 MGA Zone 50
 Projection: Transverse Mercator

Figure 4-4

- Legend**
- Horseshoe Survey Area
 - Very Good
 - Good
 - Poor
 - Completely Degraded



4.2.4 Significant Flora

No species listed as T under the EPBC Act or BC Act were recorded during the survey.

Eremophila obliquisepala (P3) was recorded at quadrats HSQ7 and HSQ8. At both quadrats the shrub occurred as single individuals. This species has been recorded at eight locations across the Murchison and Gascoyne including at the Greater Fortnum Project where it was found to be locally common, with 1229 individuals recorded in September 2019. The VT5 on Hardpan Plains is suitable habitat for this species.

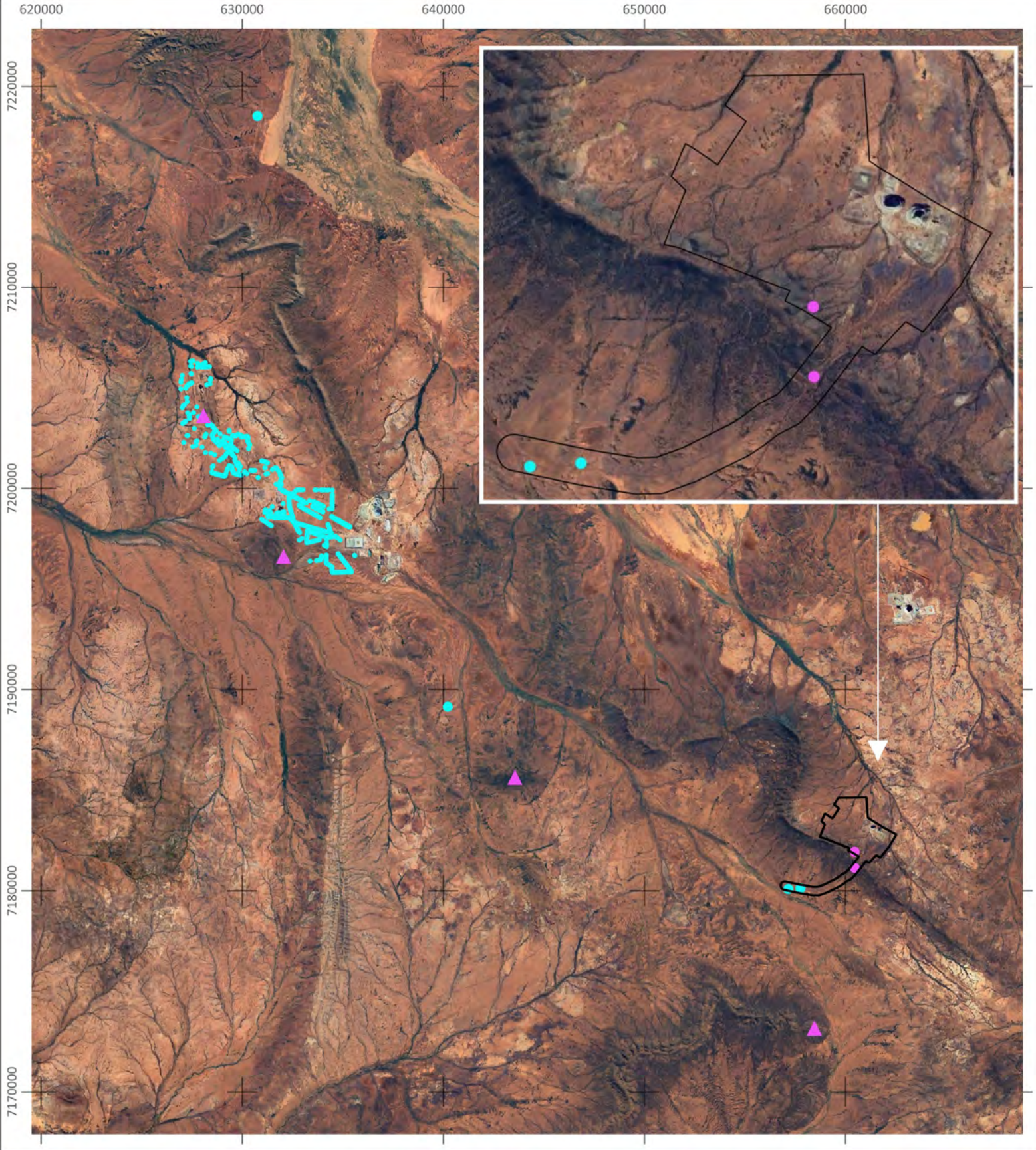
Two specimens were collected that may be the priority species *Indigofera gilesii* (P3) however the condition was unsuitable for complete taxonomic determination. On both occasions the taxa was present within the site as a single senesced individual. This species has been recorded from 29 locations across the Central Ranges, Gascoyne, Murchison, Pilbara and Tanami Regions. Locally there are four record locations in addition to the potential records at Horseshoe. The VT4 is suitable habitat for this species.

Record locations within the Survey Area are shown in Figure 4-5.

Vegetation type 4 on the crests and upper slopes of eroded ironstone, and the small outcrop at HSQ1 within the Access Road buffer are potentially suitable habitat for T flora *Pityrodia augustensis* and the nine P flora identified in Table 4-1 as having suitable habitat within the Peak Hill Land System. As seasonal conditions were limiting at the time of survey, comprehensive targeted survey was not conducted.

Pityrodia augustensis flowers between August and September and therefore this period is the recommended timing for targeted survey.

Potentially suitable habitat for *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (P3) is present in the VT5 Hardpan Plains and potentially suitable habitat for *Goodenia berringbinensis* is present in the VT6b Larger Drainage Lines.



Author: EH Date: 27/07/2026

Priority Flora Records

Prepared for:

WESTGOLD

Scale: @ A4
1: 250,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

Figure 4-5

0 1 2 km

Animal Plant Mineral Pty Ltd

- Legend**
- Horseshoe Survey Area
 - Eremophila obliquisejala
 - Indigofera ?gilesii
 - Indigofera gilesii



4.2.5 Significant Vegetation

No vegetation types occurring within the Survey Area are analogous to any known TEC's.

To determine if any of the landscapes in the Survey Area could be considered part of the Robinson Ranges PEC, the floristic communities recorded for the surveyed quadrats were compared with the vegetation communities described for the nearby Robinson Range PEC (Meissner *et al.* 2009), using MDS. Floristics and landscape parameters (including landform, rock type and soil) were input for each surveyed site plus the vegetation types from the nearby Robinson Range (Table 4-2).

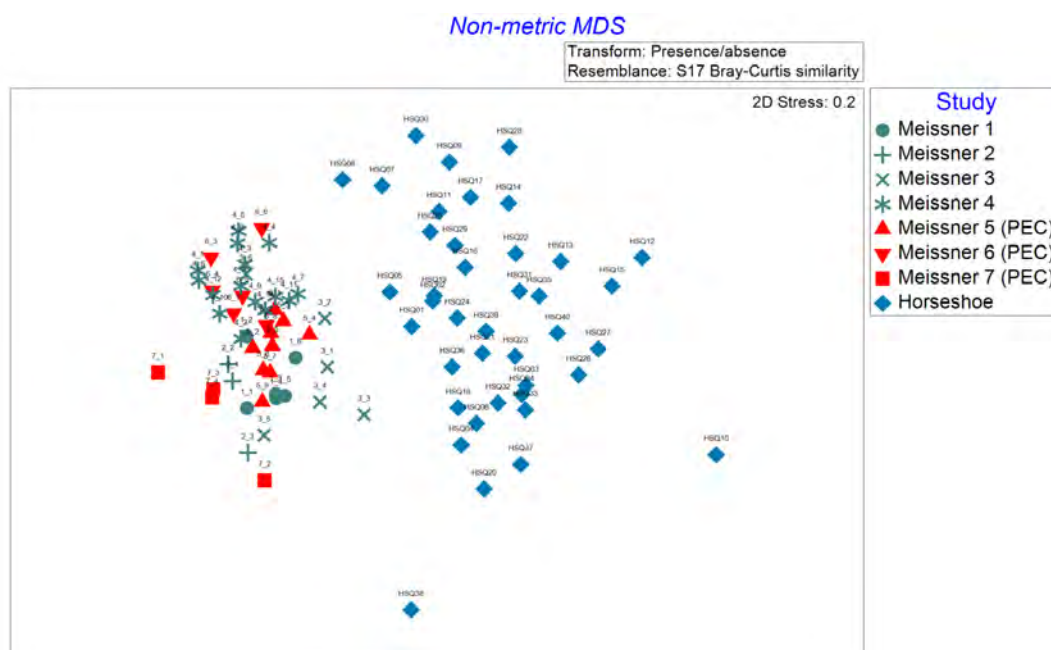


Figure 4-6. MDS ordination of quadrat data

Figure 4-6 shows the floristic composition of quadrat data recorded by Meissner *et al.* (2009) compared to those recorded at Horseshoe. Symbols shown in red indicate the Robinson Range PEC. In MDS, similarities are shown by projecting features close together in two-dimensional space; the closer the symbols appear in Figure 4-6, the more similar the species composition. Quadrats at Horseshoe show no overlap with those of Meissner *et al.* (2009), including for the PEC sites, indicating the overall floristic composition is different.

The description of the Robinson Range PEC highlights the affinity with BIF geology and identifies key indicator species (Table 4-2). Based on geology and indicator species, VT4 and the small outcrop area containing HSQ1 have been determined as representing the Robinson Ranges PEC for the following reasons:

- They occur on ironstone outcropping with boulders and exposed bedrock present
- At HSQ1 all three indicator species for Meissner *et al.* (2009) community 5 are present
- Within VT4 two indicator species for Meissner *et al.* (2009) community 5 (*Dodonaea pachyneura* and *Ptilotus schwartzii*) are present.

Figure 4-7 shows the extent of Robinson Ranges PEC within the Survey Area. Note the PEC is expected to extend along the range that runs parallel to the southern border of the main Project Area.



Author: EH Date: 27/07/2026

Robinson Ranges PEC

Prepared for: **WESTGOLD**

Figure 4-7

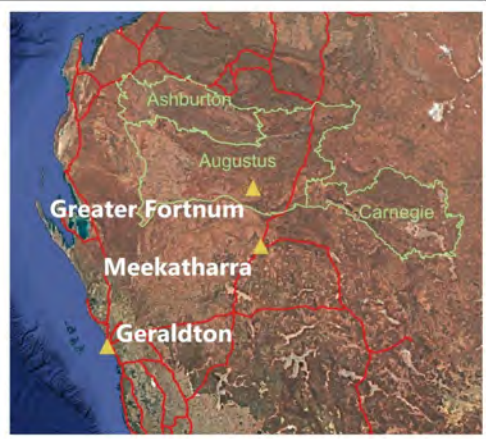
Scale: @ A4
1: 30,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

0 0.5 1 km

Animal Plant Mineral Pty Ltd

- Legend**
- Horseshoe Survey Area
 - Robinson Range vegetation complexes
Banded Iron Formation
Priority 1 Ecological Community



4.2.6 Introduced Flora

No introduced flora species were recorded in the Survey Area. No Declared Weeds or Weeds of National Significance (WONS) were recorded.

5 FAUNA RESULTS

5.1 DESKTOP STUDY

5.1.1 Significant Fauna

The DBCA database returned seven species of significant fauna that have previously been recorded within 50 km of the Survey Area. Of these, two are T, two are P, two are MI bird species, and one is Other Specially Protected (OS). Record locations of significant fauna in relation to the Survey Area are shown in Figure 5-1. The database does not contain any records for significant fauna within the Survey Area.

The PMST returned five additional T species and four MI species. These are species that do not have records within 50 km but where modelling has identified that suitable habitat may occur.

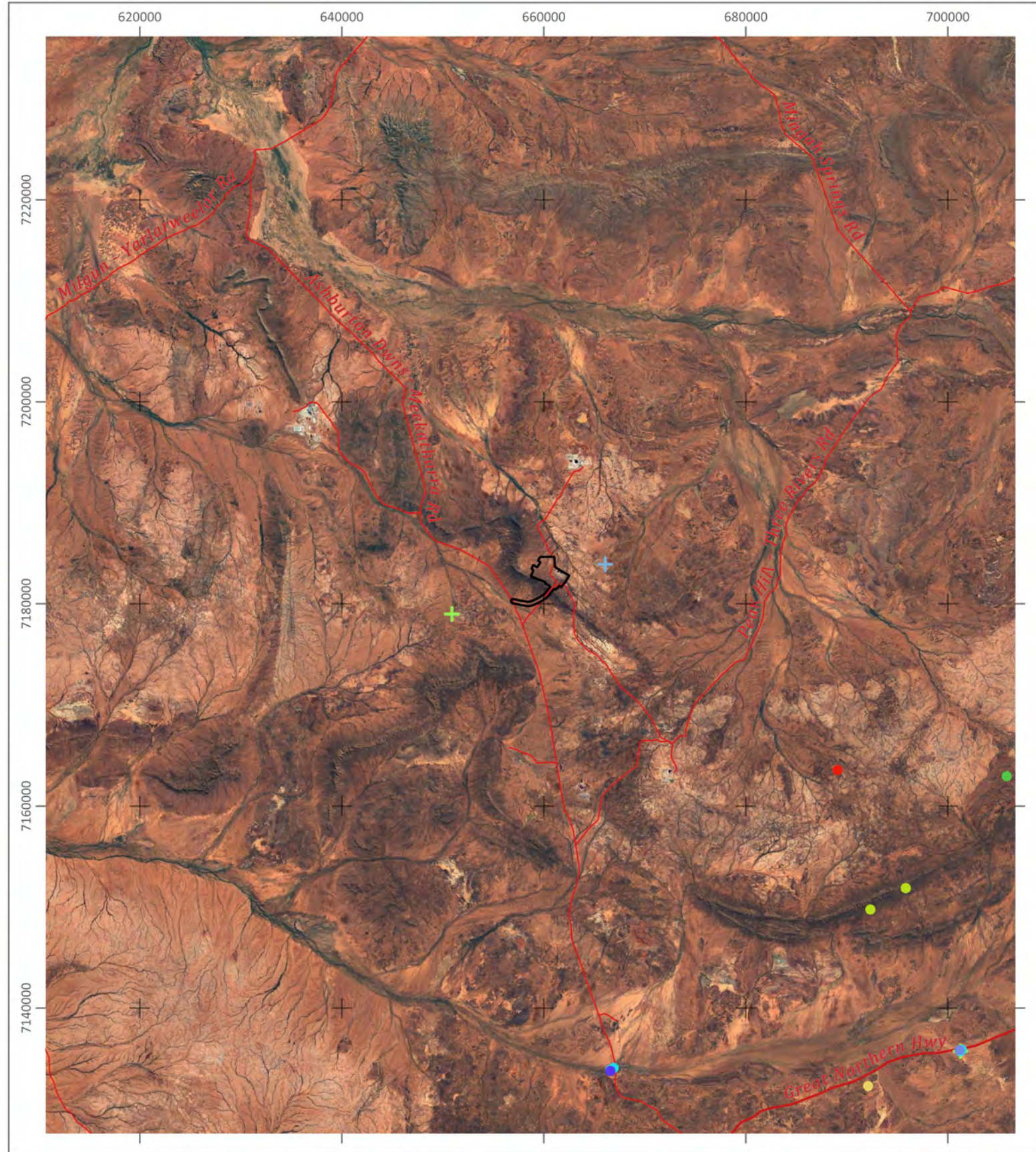
No records of T or P fauna were identified as occurring in the Survey Area from the literature review, but in addition to record details obtained from ALA (2026) provided context around local habitat preferences and utilisation. Night Parrot was not returned from any database search however the Augustus sub-region is within the high priority survey area (DBCA 2024) and therefore likelihood of occurrence has been assessed.

Database search results of T, P and MI fauna within 50 km of the Survey Area are shown in Figure 5-1 and listed in Table 5-2, with the outcome of the likelihood of occurrence assessment, with reference to the habitats available within the Survey Area.

5.1.2 Introduced Fauna

Several introduced fauna have previously been recorded in the local and regional area including:

- *Mus musculus* (House Mouse)
- *Camelus dromedarius* (Camel)
- *Bos taurus* (European Cattle)
- *Capra hircus* (Goat)
- *Felis catus* (Cat)
- *Equus asinus* (Donkey)
- *Canis lupus familiaris* (Dog)
- *Vulpes vulpes* (Fox)
- *Oryctolagus cuniculus* (Rabbit).



Author: EH

Date: 20/07/2026

Conservation Significant Fauna

Prepared for:

WESTGOLD

Scale: @ A4
1: 500,000

Coordinate System: GDA 2020 MGA Zone 50
Projection: Transverse Mercator

Figure 5-1

Legend

- Horseshoe Survey Area
- banded hare-wallaby
- + common sandpiper
- long-tailed dunnart
- malleefowl
- peregrine falcon
- sharp-tailed sandpiper
- + western pebble-mound mouse



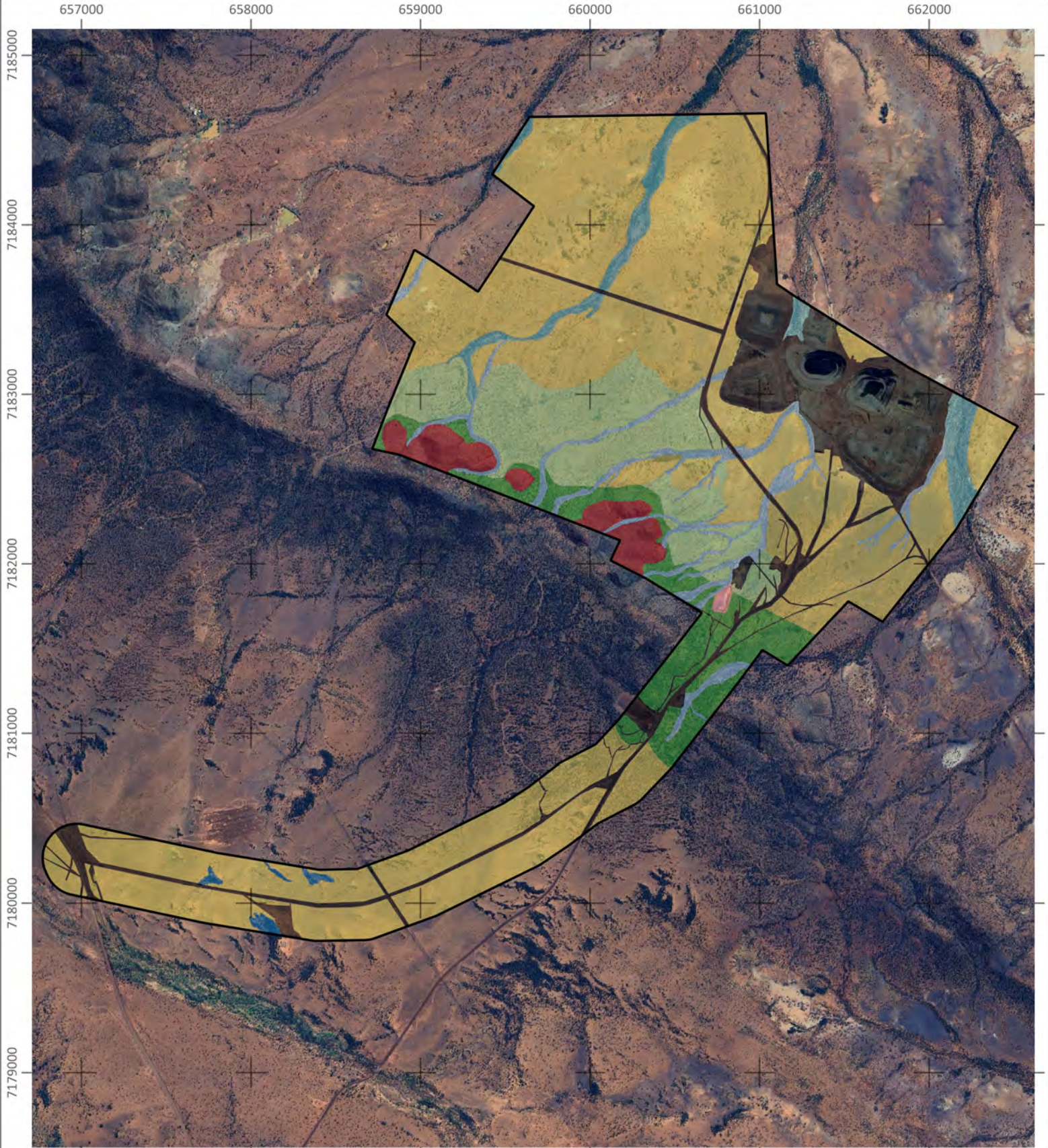
5.2 FIELD SURVEY

5.2.1 Fauna Habitats

The Survey Area is characterised by hardpan plains in the lowest elevations that border Yarlalweelor Creek, then rising steeply into the south east aspect of the banded iron outcropping of the Robinson Range and falling more gently into the stony plains and ephemeral creeklines of the lower slopes of the northern aspect of the range. Vegetation is predominantly tall open shrublands dominated by *Acacia* in the lower elevations and ephemeral creeklines, and *Acacia* and *Eremophila* mid to tall shrubs with occasional low trees on the Outcrops.

No evidence of recent fire was present during field survey. Vegetation was sparse and leaf litter was very rarely observed. Evidence of historic grazing and current grazing by feral herbivores was observed and a large flock of goats was observed in the nearby area.

Three major fauna habitats, comprising a total of 9 sub-habitats, are described for the Survey Area and are summarised in Table 5-1 with the extent in each fauna habitat shown in Figure 5-2. Fauna Habitat Assessments are listed in Appendix E and Photos of Fauna Habitat assessment sites are included in Appendix F.



Author: EH Date: 27/07/2026

Fauna Habitats

Prepared for:
WESTGOLD
 Scale: @ A4
 1: 30,000
 Coordinate System: GDA 2020 MGA Zone 50
 Projection: Transverse Mercator

Figure 5-2

- Legend**
- Horseshoe Survey Area
 - Drainage Sump
 - Foot Slopes
 - Laterite Breakaway
 - Major Drainage
 - Minor Drainage
 - Plains
 - Rugged Hilltops
 - Stony Slopes
 - Disturbed

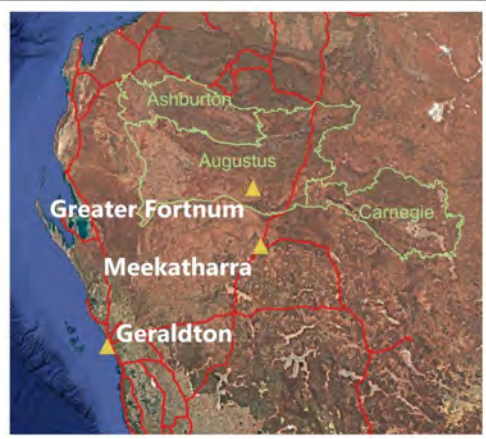
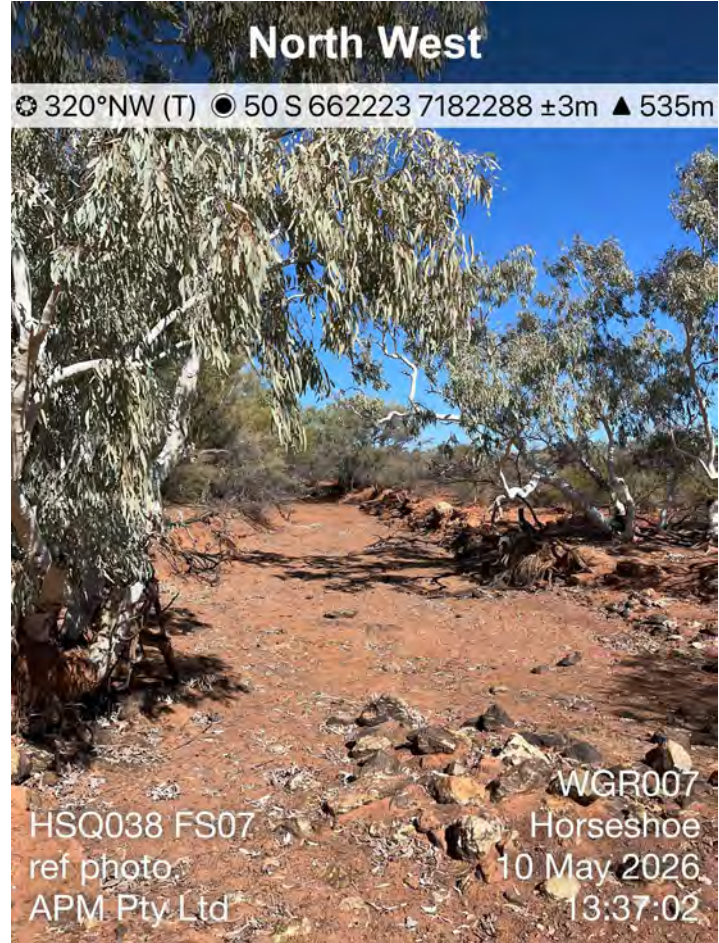
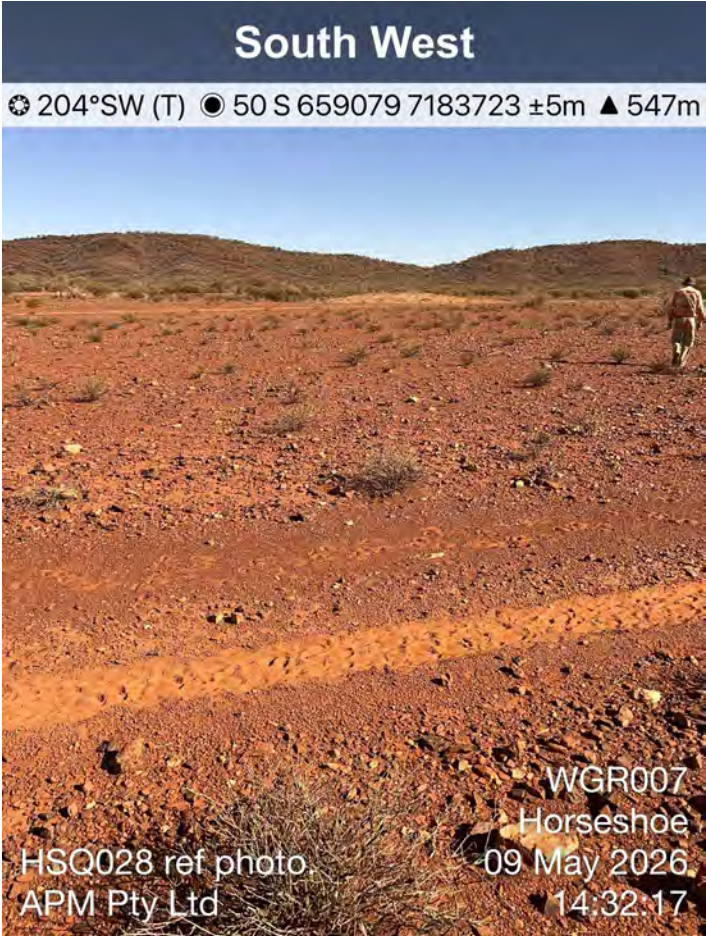


Table 5-1. Fauna habitats

Habitat	Extent		Key habitat elements	Photo
	(ha)	(%)		
Outcrops:				
Rugged Hilltops	26.9	3.1	- Large conical Banded Ironstone Hills comprise mainly of plate rock. - Quartz, ironstone and some sedimentary outcrops - Maximum height greater than 50 m generally, some rising to 100 m - Some small outcrops very isolated and small (e.g. 10 m² or less) - Boulders up to 2 m but most rocks sitting vertical in the landscape - Few crevices and cracks due to rock orientation - Disturbances: Very isolated targeted mining with two adits observed close to the southern project boundary. Both were less than 6 m deep and did not maintain a humid microclimate - Condition: Very good to pristine - Microhabitats suitable for diverse fauna but lacking significant caves and overhangs	
Foot Slopes	59.2	6.7		
Stony Slopes	104.9	11.9		

Habitat	Extent		Key habitat elements	Photo
	(ha)	(%)		
Open Acacia woodland:			• Low trees present but no hollows observed • Soils of sand to clay loam, seldom with any evidence of cave forming calcrete • Sandier patches possible for burrowing, but these were infrequent • Groundcover vegetation extremely sparse in most places • Very limited leaf litter, mostly bare ground • Condition: Grazing evidence, current cattle and feral herbivores, understory very sparse and heavily grazed • A single laterite breakaway observed and mapped in Figure 5-2. A burrow and scat observed that are expected to indicate presence of Long-tailed Dunnart.	 East ☀ 107°E (T) 🌐 50 S 660763 7181783 ±3m ▲ 550m HSQ036 FS05 LTDunnart Laterite breakaway ref photo APM Pty Ltd WGR007 Horseshoe 10 May 2026 11:11:57
Plains	481.0	54.7		
Laterite Breakaway	1.3	0.2		

Habitat	Extent		Key habitat elements	Photo
	(ha)	(%)		
Drainage:			- Two locations (north west and north east corners of the Survey Area) showed evidence of recent surface water, and support vegetation that suggest pools last longer than the surrounding landscape. These larger drainage lines have a well-developed canopy, where many hollows were observed that have the potential to support fauna including Southern Whiteface - Understory vegetation is poor to heavily degraded resulting from low recent rainfall and heavy grazing - Minor drainage lines with a predominantly dendritic flow pattern to the north were common within the Survey Area. In the flatter plains, drainage formed braided lines which made drainage vegetation corridors wider, but less dense. Generally, midstory and groundcover were sparsely vegetated, providing low cover and habitat heterogeneity for fauna. - In the plains areas, drainage run-on formed sumps in some locations where vegetation was denser than that of the surrounding plains. The value to fauna is the same as the major drainage lines. There is potential for these drainage sumps to support conservation significant species such as the Southern White-face. - Condition: Difficult to ascertain due to poor seasonal conditions but heavy recent impact of cattle easily observed in most places. - Major drainage lines holding residual water are very valuable habitats for a range of both general and conservation significant fauna.	
Major Drainage	29.5	3.4		
Minor Drainage	37.1	4.2		
Drainage Sumps	3.4	0.4		

Habitat	Extent		Key habitat elements	Photo
	(ha)	(%)		
Disturbed	136.5	15.5	• Highly erosional landscape • Little vegetation • Evidence of anthropogenic disturbance • Evidence of cattle trails and scats.	

5.2.2 Significant Fauna

Database search results of T, P and MI fauna within 50 km of the Survey Area are listed in Table 5-2, with the outcome of the likelihood of occurrence assessment, with reference to the habitats available within the Survey Area.

Table 5-2. Significant fauna Likelihood of occurrence assessment

Species	Common Name	Conservation Code		Assessment of Occurrence
		BC Act /DBCA	EPBC Act	
Birds				
<i>Actitis hypoleucos</i>	Common sandpiper	MI	MI	Unlikely. No suitable habitat for wading birds within the Survey Area.
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	VU, MI	
<i>Calidris ferruginea</i>	Curlew sandpiper	CR	CR, MI	
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	
<i>Aphelocephala leucopsis</i>	Southern Whiteface	VU	VU	Possible. No database records nearby but contemporary records available from the region and modelling suggests it is likely to occur. Suitable habitat is present in the Major Drainage and Drainage Sumps fauna habitats (Table 5-1). Habitat value is low as the groundcover vegetation was in poor condition due to high intensity grazing and low seasonal rainfall. Where observed, tree hollows suitable for Southern Whiteface roosting/breeding were recorded and marked on GPS (see Appendix F, HSSWF012).
<i>Charadrius veredus</i>	Oriental Plover	MI	MI	Possible. Prefer open, arid to semi-arid habitats, including inland claypans and dry, sparsely vegetated grasslands. No important habitat or populations present.
<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	Possible. The species has been recorded in the region and suitable foraging habitat may be present. Yarlaweelor Creek south of the Survey Area unlikely to support suitable breeding habitat due to a lack of tall tree species. One very tall river gum was observed in the north-east corner of the Survey Area but no nests were present. (Appendix F, HSFS07 fauna habitat photo).

Species	Common Name	Conservation Code		Assessment of Occurrence
		BC Act /DBCA	EPBC Act	
				Some larger Eucalyptus species were also observed in the drainage line on the north western corner of the Survey Area, but no nests were observed. Large trees potentially suitable for Grey Falcon were restricted to these two locations within the Survey Area.
<i>Falco peregrinus</i>	Peregrine Falcon	OS		Possible. The species has been recorded in the region and suitable foraging habitat may be present. There were no observed outcroppings or cliffs in the hills of the Robinson Range formation within the Project area. Nesting could occur in abandoned pits, but this was unable to be verified due to safety concerns. Local records are distributed near major drainage lines. Drainage features within the Survey Area are very small in size and lack complex vegetation structure when compared to nearby major waterways.
<i>Leipoa ocellata</i>	Malleefowl	VU	VU	Unlikely. A record from 2006 is available from the regional area, however the Survey Area lacks the dense Acacia shrubland with significant detritus load required for nest construction. It is highly unlikely that this species could persist in the area and avoid predation, due to the open vegetation and lack of cover. No mounds, including degraded historic mounds, were observed during traverses.
<i>Pezoporus occidentalis</i>	Night parrot	CR	EN	Unlikely. No reported records and not returned from the database searches however Augustus sub-region is within the High Priority survey area for Night Parrot (DBCA 2024). Suitable habitat not recorded as present, <i>Triodia</i> is absent and no complex chenopod/herbland is present.
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	Unlikely. Primarily found near fast-flowing, clear water sources such as rocky streams, rivers, and waterfalls in upland, wooded areas. Suitable habitat present in Drainage Fauna Habitat containing the drainage line within the higher elevation areas of the Peak Hill Land System. However, the infrequency of flow in the area and the degraded nature of the mid and low story vegetation in

Species	Common Name	Conservation Code		Assessment of Occurrence
		BC Act /DBCA	EPBC Act	
				the drainage area significantly reduce the habitat value for this species.
<i>Motacilla flava</i>	Yellow Wagtail	MI	MI	Unlikely. Prefers wet grassy areas near water. No suitable habitat present.
Mammals				
<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart	P4	-	Likely. Primarily occurs on rocky hills, breakaways and plateaus with open Mulga, but may also occur in open plains with a stony substrate. Records are available from 2009 in the regional area and suitable habitat occurs in the higher elevation areas of the Robinson Range. Suitable habitat occurs in the isolated Laterite breakaway Fauna Habitat, described by Fauna Habitat Assessments FS05 and FS06 (Appendix F). A burrow with scat was observed in this habitat which is likely to be from a Long-tailed Dunnart.
<i>Lagostrophus fasciatus fasciatus</i>	Banded hare-wallaby	VU	VU	Unlikely. Record is from 1909 and whilst suitable habitat may be available, the species is extinct in the local area, persisting on offshore islands and in fenced conservation reserves.
<i>Pseudomys chapmani</i>	Western pebble-mound mouse	P4	-	Unlikely. Historically present in the area however no contemporary records from the bioregion. No mounds, including degraded remnants of historic mounds, were observed during traverses.
<i>Rhinonicteris aurantia</i> (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	Unlikely. Habitats supporting deep humid caves not supported by the geology. Two small horizontal adits were observed in the hilltops just beyond the southern extent of the project area in the higher parts of the BIF range. However, both were only approximately 6 m deep and open/exposed on the hill slope. Therefore, they were not humid internally (Appendix F, Horseshoe Cave). Modelling indicates the species May occur in the buffer area only.
Reptiles				
<i>Liopholis kintorei</i>	Great Desert Skink	VU	VU	Unlikely. Prefers sandy and gravelly habitats suitable for burrowing. No records in the region. No suitable habitat expected to be present.

It is possible that Grey Falcon, Peregrine Falcon and Oriental Plover may occasionally forage within parts of the Survey Area under favourable conditions, however no breeding habitat is present and the quality of habitats is low due to impacts from current and historic clearing and grazing. No important habitat for these species is present within the Survey Area.

Potentially suitable habitat for Southern Whiteface is present in the Major Drainage Line habitat in the northeast and northwest corners of the Survey Area. Hollows suitable for breeding and roosting are present, however foraging habitat is degraded and poor quality. No Southern Whiteface were observed during survey.

Suitable habitat for the Long-tailed Dunnart was recorded at the Laterite Outcrop fauna habitat and a burrow and scat recorded during survey indicates the species is currently occupying the habitat.

For all other conservation significant fauna identified from the Desktop Study as occurring or potentially occurring in the region, there is no suitable habitat present within the Survey Areas.

5.2.3 Introduced Fauna

Cattle were ubiquitous across the site and have caused significant damage to the vegetation, particularly in places where residual water holds longer into the dry season.

6 CONCLUSIONS

6.1 FLORA

No T flora is known to occur or was recorded in the Survey Area. The flora and vegetation of the Survey Area is generally commonly occurring in the local and regional area, as determined through comparison with the results of studies available from the literature review.

The flora and vegetation survey recorded a total of 81 taxa within the Survey Area. Average species richness per quadrat was within the lower end of the range recorded by Meissner *et al.* (2009) and average richness per community was within the range recorded by Umwelt (2013) for the nearby Peak Hill area. Survey conditions were dry however as the local flora and vegetation are dominated by perennial woody species the completeness of the survey was adequate for the determination of vegetation types.

The P3 flora *Eremophila obliquisepala* was recorded at two sites within the hardpan plains of the Access Road buffer. Another P species was potentially recorded at two quadrats, *Indigofera ?gilesii* (?P3). The record locations within the Survey Area occurred on an ephemeral creekline in the lower slopes beneath the Robinson Range outcropping. The condition of the specimens was poor and complete taxonomic determination is not possible.

Several conservation significant flora that were assessed as likely or possibly occurring may not be detectable under the seasonal conditions prevalent during survey. The likelihood of occurrence assessment indicated that the T flora species *Pityrodia augustensis* may possibly occur in rocky outcrops. Vegetation type 4 and the low ironstone outcrop at HSQ1 are potentially suitable habitat for *Pityrodia augustensis* and nine Priority flora that were assessed as likely or possibly occurring in rocky outcropping. Systematic targeted search was not conducted due to the low rainfall conditions preceding survey. *Pityrodia augustensis* flowers in August/September and as such that is the recommended period for targeted search for the species.

No weeds Declared under the BAM Act or classed as WONS were recorded in the Survey Area or are known to occur in the local area from database searches or literature review sources.

6.2 VEGETATION

There are no recognised TECs located within or adjacent to the Survey Area.

One Priority Ecological Community – Robinson Range vegetation complexes Banded Iron Formation, is mapped in the DBCA databases as occurring within the Survey Area. PEC's in the DBCA databases are generally mapped with a buffer and not all areas within the DBCA mapping are necessarily reflective of the target ecological community of conservation significance. The vegetation of the Survey Area, as described by species composition and landform features, was compared to the vegetation and landform features of the Robinson Range PEC, using a combination of MDS (Clark and Gorley 2015), indicator species and geology (Meissner et al. 2009).

Based on presence of indicator species and geology, VT4 and the isolated outcrop described by HSQ1 in the Access Road buffer are designated as the Robinson Ranges PEC.

Regional Vegetation Associations within and nearby the Survey Area as described by Beard have over 99% pre-European Vegetation extent remaining. Conservation significance ranking of vegetation associations occurring within the Survey Area are of 'Least Concern'.

6.3 FAUNA AND FAUNA HABITATS

No T or P fauna species have previously been recorded in the Survey Areas; however several T and P fauna are considered Likely or Possibly occurring due to the presence of suitable habitat and are discussed below.

- Suitable foraging habitat for Southern whiteface possibly occurs within the major drainage lines and drainage sumps. However, due to the impact of cattle the current quality of the foraging microhabitats required by this species (e.g. dense understory shrubs and grasses) are lacking. Hollows were observed in some of the larger Acacia and Eucalyptus species which could be used for nesting but nesting will not occur if there is not sufficient foraging resources to sustain a local population. Foraging resources will remain unavailable while cattle and other feral herbivores persist in the area, particularly if cattle have access to permanent water in post mining pits and sumps.
- Suitable foraging habitat for Grey Falcon occurs but no nesting sites were observed in the large trees in the riparian areas. Similar quality foraging habitat is widespread in the local and regional area.
- Suitable habitat for the Long-tailed Dunnart is present in the Laterite Breakaway fauna habitat and presence of a burrow and scat indicate the habitat is currently occupied by the species.
- Suitable foraging habitat for Peregrine falcon occurs across all Survey Areas and therefore has been classified as possibly occurring. Suitable foraging habitat is widespread and the Survey Area does not contain breeding or roosting habitat or habitat important for the species.

Night Parrot survey guidelines indicate the Survey Area is within the High Priority survey area. Suitability for Night Parrot foraging and roosting/breeding habitat is Low as *Triodia* and rich low chenopod shrublands are absent. Targeted surveys using automated recording units is not required.

Migratory shorebirds, including species listed as T under the EPBC and BC Acts, may occasionally occur in Yarlarweelor Creek, immediately to the south of the Survey Area, at some time. Occurrence within the Creek would be transitory and during the non-breeding season and is outside the Survey Area.

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APPENDICES

APPENDIX A: CONSERVATION AND DECLARED CATEGORIES

Commonwealth Conservation Category descriptions are available at

<https://www.dcceew.gov.au/environment/biodiversity/threatened/nominations/forms-and-guidelines>

A list of Weeds of National Significance is available at

<https://weeds.org.au/lists/established/>

Western Australian Conservation Categories are available at

<https://www.dbca.wa.gov.au/media/792/download>

Western Australian Declared species category descriptions are available at

<https://www.dpir.wa.gov.au/online-tools/western-australian-organism-list/>

APPENDIX B: PMST SEARCH RESULTS



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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. Please see the caveat for interpretation of information provided here.

Report created: 19-Jul-2026

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment 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 (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed Migratory Species:	7

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 <https://www.dcceew.gov.au/parks-heritage/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 Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	9
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	1
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species

[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area	In buffer area only
PLANT			
Pityrodia augustensis Mt Augustus Foxglove [4962]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji, Tjalapa, Nampu [83160]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
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Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]	
Protected Area Name	Reserve Type	State	Buffer Status	
Doolgunna	NRS Addition - Gazettal in Progress	WA	In buffer area only	
EPBC Act Referrals			[Resource Information]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

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

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APPENDIX C: DETAILED FLORA AND VEGETATION SITES

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

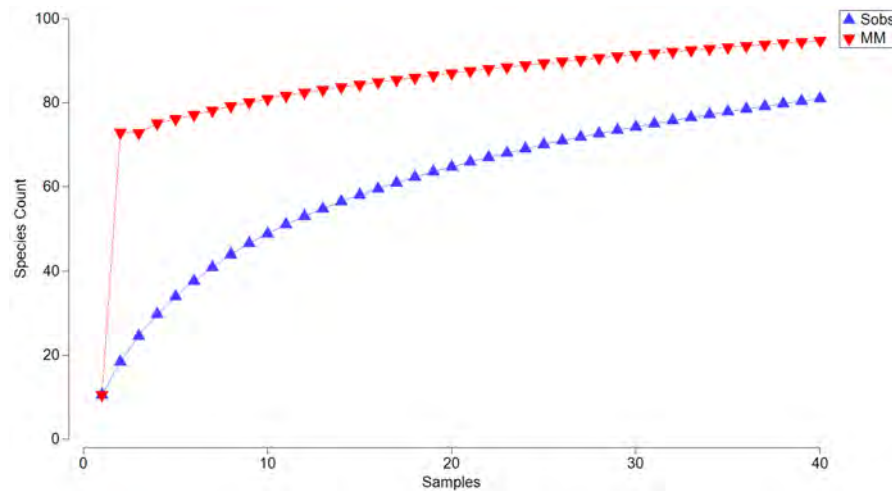
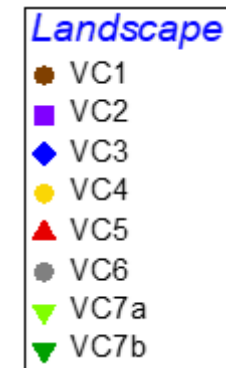


Figure C-1: Species accumulation curves showing the total number of different plant taxa as quadrats are successively pooled for the survey areas (Sobs, blue triangles). This is compared to theoretical total species richness estimated using the Michaelis-Menton (MM, red triangles) method.

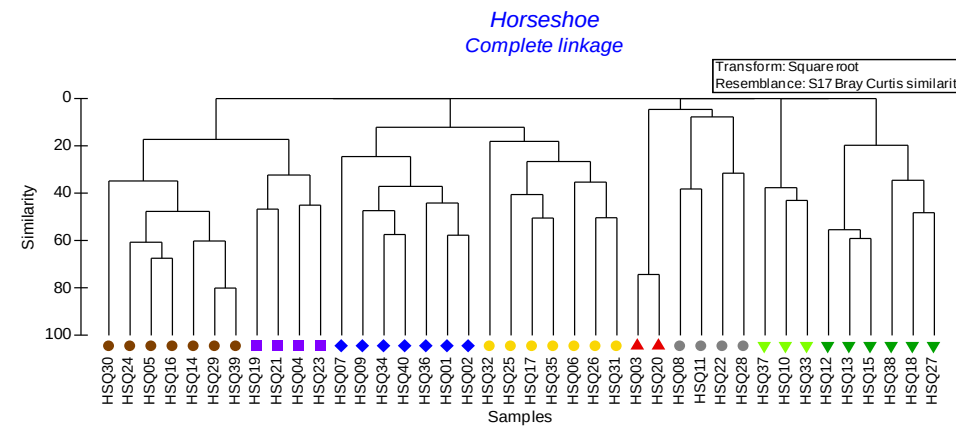
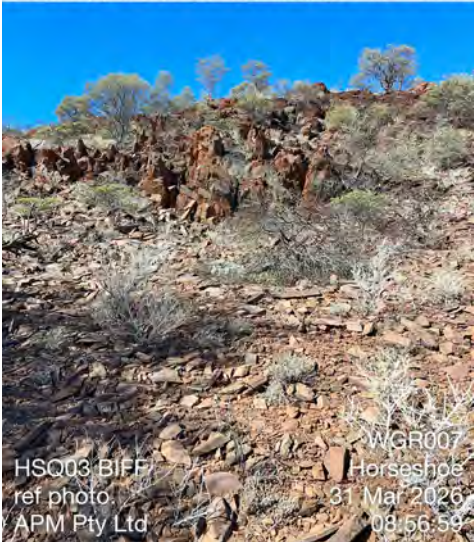


Figure C-2: Cluster analysis indicating the grouping of quadrats according to floristics. As shown by the legend, these are closely linked to Landscape.

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ01		WP-NW-(E) 660411		(N) 7181402		Site: HSQ02		WP-NW-(E) 660493		(N) 7181306	
Date: 31/03/2026		WP-NE-(E) 660427		(N) 7181414		Date: 31/03/2026		WP-NE-(E) 660498		(N) 7181323	
Botanist: NP		WP-SE-(E) 660438		(N) 7181399		Botanist: NP		WP-SE-(E) 660521		(N) 7181316	
Site Type / Size: 20x20 Quadrat		WP-SW-(E) 660419		(N) 7181387		Site Type / Size: 20x20 Quadrat		WP-SW-(E) 660515		(N) 7181297	
		North West ☉ 332°NW (T) 📍 50 S 660424 7181420 ±4m ▲ 572m  WGR007 Horseshoe APMQ1 ref photo APM Pty Ltd 31 Mar 2026 07:12:09						North West ☉ 325°NW (T) 📍 50 S 660534 7181297 ±3m ▲ 557m  WGR007 Horseshoe HSQ02 photo ref. APM Pty Ltd 31 Mar 2026 10:02:29			
Seasonal Conditions:		No significant rain		Age Since Last Fire:		>5 years		Seasonal Conditions:		No significant rain	
Soil Type:		Skeletal		Soil Colour:		Red		Soil Type:		Clay loam	
Soil Colour:		Red		Surface Rocks Size/Shape:		0.1-2m Boulder Rock		Surface Rocks Size/Shape:		0.1-10cm Rock Gravel	
Surface Rocks Size/Shape:		0.1-2m Boulder Rock		Surface Rock Cover (%):		80%		Surface Rock Cover (%):		30%	
Rock Type:		Ironstone		Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		BIFF extrusion		Landform		Lower hill slope / plain interface. Ridge saddle at plains level.		Landform		Lower hill slope / plain interface. Ridge saddle at plains level.	
Slope aspect		Steep south facing		Slope aspect		Very gentle south facing		Slope aspect		Very gentle south facing	
Vegetation Description		Open Acacia shrubland		Vegetation Description		Tall acacia shrubland		Vegetation Description		Tall acacia shrubland	
Condition		Good		Condition		Poor		Condition		Poor	
Disturbances		Partially disturbed by Road alignment		Disturbances		Influenced by upslope bund.		Disturbances		Influenced by upslope bund.	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4	5	<i>Acacia aptaneura</i>	Overstorey	4	25	<i>Acacia aptaneura</i>	Overstorey	4	25	<i>Acacia aptaneura</i>
Midstorey	1.7	1	<i>Senna glutinosa</i> ssp <i>pruinosa</i> , <i>Senna artemisioides</i>	Midstorey	3.5	5	<i>Grevillea berryana</i> , <i>Eremophila spectabilis</i>	Midstorey	3.5	5	<i>Grevillea berryana</i> , <i>Eremophila spectabilis</i>
Understorey	0.4	1	<i>Ptilotus obovatus</i> , <i>Ptilotus schwartzii</i>	Understorey	0.6	5	<i>Ptilotus obovatus</i>	Understorey	0.6	5	<i>Ptilotus obovatus</i>
Conservation Significant Flora: Representative of the BIF PEC				Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ03				Site: HSQ04			
Date: 31/03/2026				Date: 31/03/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 40x10 Drainage Quadrat			
South 182°S (T) 50 S 659129 7182786 ±4m ▲ 564m  WGR007 Horseshoe 31 Mar 2026 08:56:59 HSQ03 BIFF ref photo APM Pty Ltd				East 81°E (T) 50 S 660467 7181143 ±3m ▲ 558m  WGR007 Horseshoe 31 Mar 2026 10:24:50 HSQ04 photo ref APM Pty Ltd			
Seasonal Conditions:		No significant rain		Seasonal Conditions:		No significant rain	
Soil Type:		Skeletal loam		Soil Type:		Pepple sands	
Surface Rocks Size/Shape:		0.1-2m Boulder Rock		Surface Rocks Size/Shape:		.1-10cm Pebble Gravel Sand	
Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		Ironstone extrusion / crest		Landform		Second order drainage line, intermittent.	
Slope aspect		Steep east facing		Slope aspect		V shaped drainage.	
Vegetation Description		Low open acacia woodland		Vegetation Description		Tall dense acacia woodland	
Condition		Good		Condition		Good	
Disturbances		None		Disturbances		Some deposition from adjacent gravel road.	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	5	<i>Acacia pruinocarpa</i> , <i>Acacia aptaneura</i>	Overstorey	5	5	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i> , <i>Acacia sclerosperma</i>
Midstorey	1.4	1	<i>Eremophila galeata</i>	Midstorey	-	-	Nil
Understorey	0.3	0.5	<i>Tribulus suberosus</i>	Understorey	1	1	<i>Hibiscus</i> sp., <i>Sida ectogama</i>
Conservation Significant Flora: Representative of the BIF PEC				Conservation Significant Flora: <i>Indigofera ?gilesii</i>			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ05				Site: HSQ06			
Date: 31/03/2026				Date: 31/03/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
North 6°N (T) 50 S 659760 7180627 ±3m ▲ 561m  WGR007 Horseshoe HSQ05 photo ref. APM Pty Ltd 31 Mar 2026 11:53:51				South West 206°SW (T) 50 S 659161 7179995 ±4m ▲ 557m  WGR007 Horseshoe HSQ06 photo ref. APM Pty Ltd 31 Mar 2026 12:25:52			
Seasonal Conditions:		No significant rain		Seasonal Conditions:		No significant rain	
Soil Type:		Clay loam		Soil Type:		Clay loam	
Surface Rocks Size/Shape:		0.1-20cm Rock Boulders		Surface Rocks Size/Shape:		0.1-20cm Boulder Rock Peb.	
Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		Flat stony plain, outwash plain		Landform		Flat gravelly plain.	
Slope aspect		Flat		Slope aspect		Flat	
Vegetation Description		Open acacia shrubland grove.		Vegetation Description		Sparse low acacia shrubland	
Condition		Good		Condition		Good	
Disturbances		Historical grazing pressure		Disturbances		Historical grazing pressure	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4	20	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	3.5	1	<i>Acacia cuthbertsonii</i> , <i>Acacia craspedocarpa</i> , <i>Acacia aptaneura</i>
Midstorey	1.4	1	<i>Eremophila latrobei</i>	Midstorey	1.1	0.5	<i>Eremophila spectabilis</i>
Understorey	0.4	0.1	<i>Ptilotus obovatus</i> , <i>Ptilotus schwartzii</i>	Understorey	-	-	Nil
Conservation Significant Flora: <i>Eremophila obliquisejala</i> P3				Conservation Significant Flora: <i>Eremophila obliquisejala</i> P3			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ07				Site: HSQ08			
Date: 31/03/2026				Date: 31/03/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
East 97°E (T) 50 S 657744 7180136 ±4m ▲ 551m  WGR007 Horseshoe HSQ07 photo ref. APM Pty Ltd 31 Mar 2026 13:38:05				West 250°W (T) 50 S 657156 7180083 ±2m ▲ 549m  WGR007 Horseshoe HSQ08 photo ref. APM Pty Ltd 31 Mar 2026 14:10:39			
Seasonal Conditions:		No significant rain		Seasonal Conditions:		No significant rain	
Soil Type:		Clay loam		Soil Type:		Clay loam	
Surface Rocks Size/Shape:		0.1-20cm Rock Gravel		Surface Rocks Size/Shape:		0.1-20cm Rock Gravel	
Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		Flat plain, drainage depression		Landform		Flat stony plain.	
Slope aspect		Flat, slight depression		Slope aspect		Flat	
Vegetation Description		Acacia dense closed shrubland woodland.		Vegetation Description		Very open low acacia shrubland	
Condition		Good		Condition		Poor	
Disturbances		Some cattle evidence		Disturbances		Scalded, possibly overgrazed	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	12	20	<i>Acacia citrinoviridis</i> , <i>Acacia aptaneura</i>	Overstorey	1.6	0.5	<i>Grevillea berryana</i>
Midstorey	3.4	5	<i>Psyrax rigidula</i>	Midstorey	-	-	Nil
Understorey	0.4	2	<i>Eriachne mucronata</i>	Understorey	0.6	0.5	<i>Ptilotus schwartzii</i> , <i>Eremophila compacta</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ09				Site: HSQ010			
Date: 10/05/2026				Date: 10/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
South 173°S (T) 50 S 661145 7181736 ±4m ▲ 547m  WGR007 Horseshoe HSQ09 ref photo. APM Pty Ltd 10 May 2026 16:06:47				North East 65°NE (T) 50 S 661349 7182358 ±6m ▲ 539m  WGR007 Horseshoe HSQ010 ref photo. APM Pty Ltd 10 May 2026 14:40:32			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Sand silt	
Surface Rocks Size/Shape:		0.01-5cm Pebbles and gravel		Surface Rocks Size/Shape:		0.1-4cm Rocks and gravel	
Rock Type:		Ironstone		Rock Type:		Ironstone and quartzite	
Landform		Open floodplain		Landform		Open flat storey plain	
Slope aspect		Flat		Slope aspect		Very slight rise	
Vegetation Description		Low open acacia woodland with little to no understorey (historic grazing effects).		Vegetation Description		Very sparse acacia woodland with very sparse mixed shrub understorey.	
Condition		Degraded		Condition		Degraded	
Disturbances		Overgrazed		Disturbances		Cattle	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	20	<i>Acacia aptaneura</i>	Overstorey	3.5	2	<i>Acacia cuthbertsonii</i> , <i>Acacia sclerosperma</i>
Midstorey	-	-	Nil	Midstorey	-	-	Nil
Understorey	0.4	0.1	<i>Ptilotus obovatus</i>	Understorey	1.5	5	<i>Scaevola spinescens</i> , <i>Eremophila gilesii</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

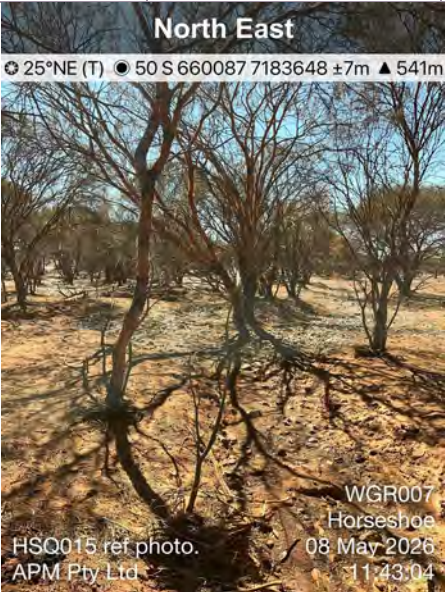
DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ011				Site: HSQ012			
Date: 08/05/2026				Date: 08/25/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
WP -(E) 660870 WP-NW-(E) 660888 WP-NE-(E) 660894 WP-SE-(E) 660875				WP -(E) 660673 WP-NW-(E) 660693 WP-NE-(E) 660707 WP-SE-(E) 660690			
(N) 7184494 (N) 7184500 (N) 7184477 (N) 7184473				(N) 7184787 (N) 7184803 (N) 7184785 (N) 7184771			
South 197°S (T) 50 S 660887 7184496 ±3m ▲ 533m  WGR007 Horseshoe 08 May 2026 08:36:59 HSQ011 ref photo APM Pty Ltd				South West 245°SW (T) 50 S 660700 7184786 ±3m ▲ 533m  WGR007 Horseshoe 08 May 2026 09:15:27 HSQ012 ref photo APM Pty Ltd			
Seasonal Conditions:		Very dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Red loam	
Surface Rocks Size/Shape:		0.01-15cm Rocks and gravel		Surface Rocks Size/Shape:		N/A	
Rock Type:		Ironstone and quartzite		Rock Type:		N/A	
Landform		Flat plain		Landform		Open plains drainage – significant 3 rd /2 nd order	
Slope aspect		Flat		Slope aspect		Flat	
Vegetation Description		Very open acacia woodland with sparse shrub understorey.		Vegetation Description		Dense acacia tall woodland. Sparse understorey litter with few shrubs.	
Condition		Good		Condition		Good	
Disturbances		Bare		Disturbances		Cattle	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4	2	<i>Acacia aptaneura</i>	Overstorey	6	25	<i>Acacia cyperophylla</i> , <i>Acacia aptaneura</i>
Midstorey	1.5	0.5	<i>Eremophila</i> sp.	Midstorey	2.5	2	<i>Acacia tetragonophylla</i>
Understorey	0.4	0.1	<i>Ptilotus schwartzii</i>	Understorey	0.2	0.5	<i>Poaceae</i> sp. (dead)
Conservation Significant Flora: None				Conservation Significant Flora: None			

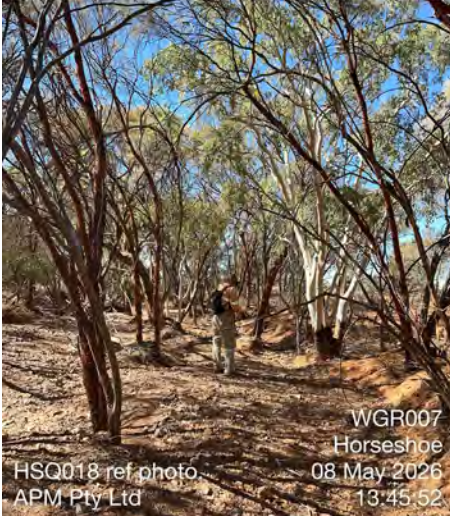
DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ013				Site: HSQ014			
Date: 08/05/2026				Date: 08/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
East 107°E (T) 50 S 660467 7184586 ±3m ▲ 531m  WGR007 Horseshoe HSQ013 ref.photo. APM Pty Ltd 08 May 2026 10:11:01				West 269°W (T) 50 S 660662 7184083 ±10m ▲ 534m  WGR007 Horseshoe HSQ014 ref.photo. APM Pty Ltd 08 May 2026 10:49:58			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Clay loam	
Age Since Last Fire:		5 years		Age Since Last Fire:		5 years	
Soil Colour:		Red		Soil Colour:		Red	
Surface Rocks Size/Shape:		0.01-0.5cm Gravel		Surface Rocks Size/Shape:		0.01-0.1cm Rocks and pebbles	
Surface Rock Cover (%):		10%		Surface Rock Cover:		80%	
Rock Type:		Ironstone		Rock Type:		Quartzite	
Landform		2 nd order broad braided drainage on open plain		Landform		Flat to very slightly raised plain	
Slope aspect		Flat		Slope aspect		Very slight conical rise	
Vegetation Description		Acacia woodland with sparse shrub understorey		Vegetation Description		Very sparse open acacia woodland	
Condition		Good		Condition		Good	
Disturbances		Cattle		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4.5	10	<i>Acacia aptaneura</i>	Overstorey	5.5	0.5	<i>Acacia pruinocarpa</i>
Midstorey	1.4	6.5	<i>Senna artemisioides</i>	Midstorey	1.4	0.5	<i>Eremophila</i> sp.
Understorey	-	-	Nil	Understorey	-	-	Nil
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ015				Site: HSQ016			
Date: 08/05/2026				Date: 08/05/2026			
Botanist: NP				Botanist: ML			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
North East 25°NE (T) 50 S 660087 7183648 ±7m ▲ 541m  WGR007 Horseshoe HSQ015 ref photo. APM Pty Ltd 08 May 2026 11:43:04				East 82°E (T) 50 S 659681 7183905 ±5m ▲ 541m  WGR007 Horseshoe HSQ016 ref photo. APM Pty Ltd 08 May 2026 12:24:50			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Gravel sand		Soil Type:		Clay loam	
Surface Rocks Size/Shape:		0.01-0.2cm Rocks and gravel		Surface Rocks Size/Shape:		0.01-0.3cm Rocks and gravel	
Rock Type:		Ironstone		Rock Type:		Ironstone and quartzite	
Landform		2 nd order drainage on broad plain		Landform		Open quartz and ironstone plain	
Slope aspect		Flat braided channel		Slope aspect		Flat	
Vegetation Description		Open acacia woodland with very sparse shrub understorey		Vegetation Description		Sparse and patchy tall acacia shrubland. Waves or groves of dense patches.	
Condition		Good		Condition		Good	
Disturbances		Cattle and camel		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4.5	10	<i>Acacia cyperophylla</i>	Overstorey	4	5	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>
Midstorey	3	1	<i>Acacia tetragonophylla</i>	Midstorey	-	-	Nil
Understorey	0.5	0.5	<i>Eremophila galeata</i>	Understorey	0.5	1	<i>Eremophila spathulata</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ017				Site: HSQ018			
Date: 08/05/2026				Date: 08/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
South West 208°SW (T) ● 50 S 659816 7184544 ±4m ▲ 537m  WGR007 Horseshoe HSQ017 ref photo APM Pty Ltd 08 May 2026 13:26:10				North East 47°NE (T) ● 50 S 659615 7184539 ±4m ▲ 536m  WGR007 Horseshoe HSQ018 ref photo APM Pty Ltd 08 May 2026 13:45:52			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Sand loam	
Surface Rocks Size/Shape:		0.01-20cm Rocks and stones		Surface Rocks Size/Shape:		0.01-20cm Gravel	
Rock Type:		Quartzite		Rock Type:		Ironstone	
Landform		Open quark plain		Landform		Major-minor drainage line 3 rd /2 nd order	
Slope aspect		Flat		Slope aspect		V drainage	
Vegetation Description		Sparse low acacia woodland with sparse shrub understorey		Vegetation Description		Closed tall acacia woodland with sparse mixed understorey	
Condition		Good		Condition		Good	
Disturbances		None		Disturbances		Cattle	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4.5	2	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	6	40	<i>Acacia cyperophylla</i>
Midstorey	-	-	Nil	Midstorey	3.5	2	<i>Acacia quadrimarginea</i>
Understorey	0.5	0.5	<i>Eremophila spathulata</i>	Understorey	1	0.5	<i>Sida ectogama</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ019				Site: HSQ020			
Date: 08/05/2026				Date: 09/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
South West 228°SW (T) 50 S 660640 7183175 ±7m ▲ 540m  WGR007 Horseshoe HSQ019 ref photo. APM Pty Ltd 08 May 2026 14:56:08				North West 314°NW (T) 50 S 660228 7182301 ±3m ▲ 568m  WGR007 Horseshoe HSQ020 ref photo. APM Pty Ltd 09 May 2026 07:30:17			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay		Soil Type:		Skeletal	
Surface Rocks Size/Shape:		0.01-20cm Rocks and gravel		Surface Rocks Size/Shape:		0.1-2m Boulders, large plate rock, strong soil	
Rock Type:		Ironstone		Rock Type:		Banded iron formation	
Landform		Drainage sump/depression		Landform		Conical hill at base of large BIF range	
Slope aspect		Flat		Slope aspect		Conical	
Vegetation Description		Dense acacia woodland grove on open storey plain with shrub understorey		Vegetation Description		Sparse acacia woodland with mixed shrub understorey	
Condition		Good		Condition		Very good	
Disturbances		None		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	5.5	25	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	4	2	<i>Acacia rhodophloia</i>
Midstorey	-	-	nil	Midstorey	2.5	5	<i>Eremophila galeata</i>
Understorey	0.5	5	<i>Rhagodia eremaea</i>	Understorey	0.7	5	<i>Tribulus suberosus</i> , <i>Ptilotus obovatus</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ021				Site: HSQ022			
Date: 08/05/2026				Date: 08/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
North 17°N (T) 50 S 660459 7182618 ±8m ▲ 545m WGR007 Horseshoe HSQ021 ref photo. APM Pty Ltd 09 May 2026 08:18:33				East 97°E (T) 50 S 660250 7182512 ±5m ▲ 549m WGR007 Horseshoe HSQ022 ref photo. APM Pty Ltd 09 May 2026 09:01:33			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Sandy loam		Soil Type:		Clay loam	
Age Since Last Fire:		> 5 years		Age Since Last Fire:		> 5 years	
Soil Colour:		Red		Soil Colour:		Red	
Surface Rocks Size/Shape:		N/A		Surface Rocks Size/Shape:		0.01-30cm Small boulders and rocks	
Surface Rock Cover (%):		N/A		Surface Rock Cover:		80%	
Rock Type:		N/A		Rock Type:		Quartzite	
Landform		2 nd order drainage		Landform		Gentle footslope of range	
Slope aspect		V drainage flow east		Slope aspect		East facing gentle	
Vegetation Description		Closed acacia woodland with mixed shrub understorey		Vegetation Description		Very sparse acacia woodland with sparse mixed shrub woodland	
Condition		Very good		Condition		Good	
Disturbances		Cattle and goat		Disturbances		Cattle observed	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	6	30	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	3.5	2	<i>Acacia rhodophloia</i> , <i>Acacia aptaneura</i>
Midstorey	3.5	2	<i>Eremophila galeata</i> , <i>Acacia tetragonophylla</i>	Midstorey	-	-	Nil
Understorey	0.5	5	<i>Sida ectogama</i> , <i>Rhagodia eremaea</i>	Understorey	0.5	1	<i>Ptilotus rotundifolius</i> , <i>Eremophila compacta</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ023		WP -(E) 659725		(N) 7182556		Site: HSQ024		WP -(E) 659370		(N) 7182471									
Date: 09/05/2026		WP-NW-(E) 659743		(N) 7182566		Date: 09/05/2026		WP-NW-(E) 659389		(N) 7182475									
Botanist: NP		WP-NE-(E) 659750		(N) 7182544		Botanist: NP		WP-NE-(E) 659394		(N) 7182453									
Site Type / Size: 20x20 Quadrat		WP-SE-(E) 659732		(N) 7182534		Site Type / Size: 20x20 Quadrat		WP-SE-(E) 659375		(N) 7182450									
		North East 📍 45°NE (T) 📍 50 S 659727 7182537 ±8m ▲ 557m  WGR007 Horseshoe 09 May 2026 09:32:45 HSQ023 ref photo APM Pty Ltd										South East 📍 152°SE (T) 📍 50 S 659395 7182470 ±6m ▲ 582m  WGR007 Horseshoe 09 May 2026 10:40:34 HSQ024 ref photo APM Pty Ltd							
Seasonal Conditions:		Dry		Age Since Last Fire:		5 years		Seasonal Conditions:		Dry		Age Since Last Fire:		> 5 years					
Soil Type:		Silt loam		Soil Colour:		Red		Soil Type:		Skeletal		Soil Colour:		Black red					
Surface Rocks Size/Shape:		0.01-15cm Small rocks and gravel		Surface Rock Cover (%):		90%		Surface Rocks Size/Shape:		.01-.75m rocks boulders		Surface Rock Cover:		90%					
Rock Type:		Ironstone						Rock Type:		Banded iron formation									
Landform		Foothill outwash plain						Landform		Lower conical hills East of proper BIF range									
Slope aspect		East						Slope aspect		West									
Vegetation Description		Open acacia woodland with mixed shrub understorey						Vegetation Description		Open acacia woodland with mixed shrub understorey									
Condition		Good						Condition		Very good									
Disturbances		Cattle						Disturbances		None									
Strata	Height (m)	Cover (%)	Species			Strata	Height (m)	Cover (%)	Species										
Overstorey	4.5	5	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>			Overstorey	5	15	<i>Acacia aptaneura</i> , <i>Acacia rhodophloia</i>										
Midstorey	3	0.5	<i>Acacia marramamba</i>			Midstorey	-	-	Nil										
Understorey	1.2	0.5	<i>Senna artemisioides</i> ssp. <i>helmsii</i>			Understorey	1.2	2	<i>Senna</i> spp., <i>Eremophila</i> spp.										
Conservation Significant Flora: None							Conservation Significant Flora: None												

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ025				Site: HSQ026			
Date: 09/05/2026				Date: 09/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
North 11°N (T) 50 S 659075 7182999 ±4m ▲ 555m  WGR007 Horseshoe HSQ025 ref photo APM Pty Ltd 09 May 2026 12:11:01				South East 127°SE (T) 50 S 658950 7182968 ±4m ▲ 557m  WGR007 Horseshoe HSQ026 ref photo APM Pty Ltd 09 May 2026 12:05:40			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Silt sand		Soil Type:		Silt sand	
Surface Rocks Size/Shape:		0.01-15cm Rocks and gravel		Surface Rocks Size/Shape:		0.01-20cm Rocks and gravel	
Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		Outwash plain adjacent to BIF range		Landform		Rock gravel outwash plain East of BIF	
Slope aspect		Gentle East low		Slope aspect		Gentle East	
Vegetation Description		Sparse acacia woodland with sparse shrub understorey		Vegetation Description		Sparse low acacia woodland with sparse shrub understorey	
Condition		Good		Condition		Good	
Disturbances		None		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	5	<i>Acacia aptaneura</i>	Overstorey	4	2	<i>Acacia aptaneura</i>
Midstorey	2.5	0.5	<i>Acacia marramamba</i>	Midstorey	-	-	Nil
Understorey	0.4	0.1	<i>Ptilotus schwartzii</i>	Understorey	1.1	2	<i>Eremophila spectabilis</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ027		WP -(E) 659261		(N) 7183247		Site: HSQ028		WP -(E) 659078		(N) 7183723					
Date: 09/05/2026		WP-NW-(E) 659272		(N) 7183263		Date: 09/05/2026		WP-NW-(E) 659096		(N) 7183716					
Botanist: NP		WP-NE-(E) 659289		(N) 7182253		Botanist: NP		WP-NE-(E) 659088		(N) 7183696					
Site Type / Size: 20x20 Quadrat		WP-SE-(E) 659277		(N) 7183238		Site Type / Size: 20x20 Quadrat		WP-SE-(E) 659067		(N) 7183703					
		North 📍 16°N (T) 📍 50 S 659275 7183235 ±3m ▲ 546m  WGR007 Horseshoe HSQ027 ref photo. APM Pty Ltd 09 May 2026 13:42:30										South West 📍 204°SW (T) 📍 50 S 659079 7183723 ±5m ▲ 547m  WGR007 Horseshoe HSQ028 ref photo. APM Pty Ltd 09 May 2026 14:32:17			
Seasonal Conditions:		Dry		Age Since Last Fire:		> 5 years		Seasonal Conditions:		Dry					
Soil Type:		Sandy loam		Soil Colour:		Red		Soil Type:		Clay loam					
Surface Rocks Size/Shape:		0.01-15cm Rocks and gravel		Surface Rock Cover (%):		10%		Surface Rocks Size/Shape:		0.01-15cm Rocks and gravel					
Rock Type:		Ironstone				Rock Type:		Ironstone and quartzite							
Landform		Minor drainage confluence				Landform		Open stony plain							
Slope aspect		East				Slope aspect		Flat							
Vegetation Description		Acacia woodland with very sparse mixed shrub understorey				Vegetation Description		Extremely sparse very low shrubland							
Condition		Good				Condition		Poor							
Disturbances		Cattle				Disturbances		Digging ripped rehab							
Strata	Height (m)	Cover (%)	Species												
Overstorey	5.5	15	<i>Acacia cyperophylla</i>												
Midstorey	2.5	2	<i>Acacia kempeana</i>												
Understorey	1.2	5	<i>Eremophila</i> spp.												
Conservation Significant Flora: None					Conservation Significant Flora: None										

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ029				Site: HSQ030			
Date: 09/05/2026				Date: 09/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
WP -(E) 659599 WP-NW-(E) 659620 WP-NE-(E) 659617 WP-SE-(E) 659598				WP -(E) 660170 WP-NW-(E) 660191 WP-NE-(E) 660185 WP-SE-(E) 660167			
(N) 7183520				(N) 7183467			
(N) 7183516				(N) 7183401			
(N) 7183498				(N) 7183440			
(N) 7183500				(N) 7183446			
South East 116°SE (T) 50 S 659598 7183507 ±3m ▲ 544m  WGR007 Horseshoe HSQ029 ref photo APM Pty Ltd 09 May 2026 15:04:13				North 12°N (T) 50 S 660167 7183444 ±3m ▲ 541m  WGR007 Horseshoe HSQ030 ref photo APM Pty Ltd 09 May 2026 15:25:01			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Clay	
Age Since Last Fire:		>5 years		Age Since Last Fire:		>5 years	
Soil Colour:		Red		Soil Colour:		Red	
Surface Rocks Size/Shape:		0.01-10cm Gravel and stone		Surface Rocks Size/Shape:		0.01-10cm Rocks and pebbles	
Surface Rock Cover (%):		30%		Surface Rock Cover:		90%	
Rock Type:		Ironstone and quartzite		Rock Type:		Ironstone	
Landform		Open stony plain		Landform		Very broad braided gibber plain	
Slope aspect		Flat		Slope aspect		Conical (very slight)	
Vegetation Description		Very open acacia woodland with very sparse mixed shrub understorey		Vegetation Description		Very sparse acacia woodland with sparse shrub understorey	
Condition		Good		Condition		Good	
Disturbances		Cattle		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4.5	10	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	4.5	2	<i>Acacia pruinocarpa</i>
Midstorey	-	-	Nil	Midstorey	-	-	Nil
Understorey	0.6	0.5	<i>Senna</i> spp.	Understorey	0.7	1	<i>Eremophila spathulata</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ031				Site: HSQ032			
Date: 10/05/2026				Date: 10/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
West ☉ 253°W (T) ● 50 S 660086 7182960 ±5m ▲ 546m HSQ031 ref photo. APM Pty Ltd WGR007 Horseshoe 10 May 2026 06:42:26				South West ☉ 206°SW (T) ● 50 S 660674 7182289 ±5m ▲ 546m HSQ032 Tecticornia ref photo APM Pty Ltd WGR007 Horseshoe 10 May 2026 07:37:55			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay		Soil Type:		Sand silt	
Age Since Last Fire:		5 years		Age Since Last Fire:		5 years	
Soil Colour:		Red		Soil Colour:		Red	
Surface Rocks Size/Shape:		0.01-10cm Rocks and gravel		Surface Rocks Size/Shape:		0.01-10cm Rocks and gravel	
Surface Rock Cover (%):		80%		Surface Rock Cover:		80%	
Rock Type:		Ironstone		Rock Type:		Ironstone	
Landform		Flat open stony plain gibber		Landform		Flat open stony plain	
Slope aspect		Flat		Slope aspect		Flat	
Vegetation Description		Very sparse low acacia woodland with sparse mixed shrub understorey		Vegetation Description		Open acacia woodland with mixed shrub understorey	
Condition		Good		Condition		Very good	
Disturbances		Cattle		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	2	<i>Acacia aptaneura</i> , <i>Acacia pruinocarpa</i>	Overstorey	4.5	15	<i>Acacia aptaneura</i>
Midstorey	2	0.5	<i>Acacia tetragonophylla</i>	Midstorey	3	5	<i>Hakea preissii</i>
Understorey	0.9	0.5	<i>Eremophila spectabilis</i> , <i>Senna artemisioides</i> ssp. <i>helmsii</i>	Understorey	0.6	5	<i>Tecticornia</i> sp., <i>Eremophila</i> sp.
Conservation Significant Flora: None				Conservation Significant Flora: None			

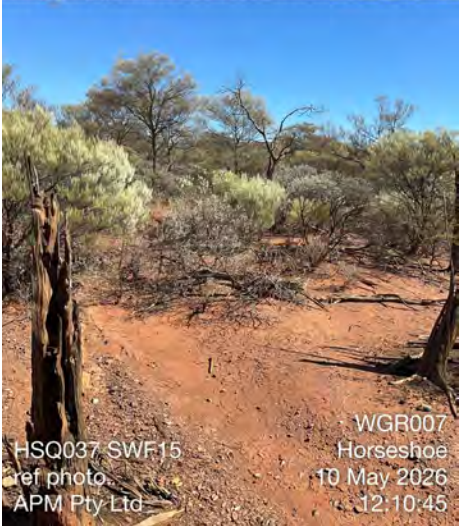
DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ033				Site: HSQ034			
Date: 10/05/2026				Date: 10/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
WP -(E) 660805 WP-NW-(E) 660819 WP-NE-(E) 660833 WP-SE-(E) 660818				WP -(E) 660449 WP-NW-(E) 660465 WP-NE-(E) 660467 WP-SE-(E) 660453			
(N) 7182118 (N) 7182132 (N) 7182114 (N) 7182101				(N) 7181951 (N) 7181953 (N) 7181934 (N) 7181933			
South 189°S (T) 50 S 660815 7182129 ±6m ▲ 544m  HSQ033 Tecticornia ref photo APM Pty Ltd WGR007 Horseshoe 10 May 2026 08:18:12				South West 228°SW (T) 50 S 660479 7181955 ±4m ▲ 556m  HSQ034 out of chenopod area ref photo APM Pty Ltd WGR007 Horseshoe 10 May 2026 10:10:08			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Sand silt		Soil Type:		Sand silt	
Age Since Last Fire:		>5 years		Age Since Last Fire:		>5 years	
Soil Colour:		Brown red		Soil Colour:		Red	
Surface Rocks Size/Shape:		0.1-10cm Gravel and scree		Surface Rocks Size/Shape:		0.01-30cm Rocks and gravel	
Surface Rock Cover (%):		70%		Surface Rock Cover:		70%	
Rock Type:		Laterite and ironstone		Rock Type:		Ironstone	
Landform		Outwash plain, base of BIF, flat open scree deposits with some exposed laterite underlayer and outwash braided drainage		Landform		Footslope outwash scree	
Slope aspect		Gentle East slope		Slope aspect		East	
Vegetation Description		Open low acacia woodland with chenopod shrub understorey		Vegetation Description		Acacia woodland with mixed shrub understorey. West of chenopod shrubland boundary.	
Condition		Good		Condition		Good	
Disturbances		Cattle observed and working bulldozer scrapes		Disturbances		Cattle	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	5	<i>Acacia cuthbertsonii</i> , <i>Acacia aptaneura</i>	Overstorey	4.5	20	<i>Acacia aptaneura</i>
Midstorey	<1.8	1	<i>Eremophila spectabilis</i>	Midstorey	1.8	5	<i>Eremophila galeata</i>
Understorey	0.5	2	<i>Tecticornia doleiformis</i>	Understorey	0.6	0.5	<i>Senna</i> sp., <i>Enchylaena tomentosa</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ035				Site: HSQ036			
Date: 10/05/2026				Date: 10/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
North 347°N (T) 50 S 661023 7181904 ±9m ▲ 547m  WGR007 Horseshoe HSQ035 ref photo APM Pty Ltd 10 May 2026 10:30:26				South East 139°SE (T) 50 S 660759 7181736 ±7m ▲ 550m  WGR007 Horseshoe HSQ036 Laterite breakaway ref photo APM Pty Ltd 10 May 2026 10:56:25			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Silt sand		Soil Type:		Gravel sand	
Surface Rocks Size/Shape:		0.01-20cm Small boulder rocks		Surface Rocks Size/Shape:		0.01-50cm Gravel and boulders	
Rock Type:		Ironstone		Rock Type:		Laterite	
Landform		Very low extremely rounded ironstone rise possibly historic range toe		Landform		Closed laterite break away, rectangle shape	
Slope aspect		Flat		Slope aspect		North	
Vegetation Description		Open low acacia woodland with sparse mixed shrub understorey		Vegetation Description		Low sparse acacia woodland with sparse shrub understorey	
Condition		Good		Condition		Good	
Disturbances		Working bulldozer scrapes		Disturbances		None	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	3.5	5	<i>Acacia aptaneura</i>	Overstorey	3.5	2	<i>Acacia aptaneura</i>
Midstorey	1.2	2	<i>Senna</i> spp.	Midstorey	-	-	Nil
Understorey	0.4	0.5	<i>Maireana aphylla</i> , <i>Enchylaena tomentosa</i>	Understorey	0.9	0.5	<i>Eremophila spectabilis</i>
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ037				Site: HSQ038			
Date: 10/05/2026				Date: 10/05/2026			
Botanist: NP				Botanist: NP			
Site Type / Size: 20x20 Quadrat				Site Type / Size: 20x20 Quadrat			
West 261°W (T) 50 S 660981 7182659 ±5m ▲ 540m  WGR007 Horseshoe 10 May 2026 12:10:45				South 164°S (T) 50 S 662204 7182318 ±5m ▲ 534m  WGR007 Horseshoe 10 May 2026 13:34:49			
Seasonal Conditions:		Dry		Seasonal Conditions:		Dry	
Soil Type:		Clay loam		Soil Type:		Sandy gravel	
Surface Rocks Size/Shape:		0.01-20cm Rocks and gravel		Surface Rocks Size/Shape:		0.01-50cm Rocks and small boulders	
Rock Type:		Ironstone and quartzite		Rock Type:		Quartzite	
Landform		1 st /2 nd order broad drainage. Elements of the chenopod shrubland.		Landform		Major drainage, boulder rock bed	
Slope aspect		Flat		Slope aspect		Drainage, flat	
Vegetation Description		Closed acacia woodland with mixed shrub understorey		Vegetation Description		Eucalyptus and acacia open gallery forest in river channel	
Condition		Very good		Condition		Good	
Disturbances		Cattle, also close to mine but upstream		Disturbances		Cattle observed	
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species
Overstorey	4	20	<i>Acacia sclerosperma</i>	Overstorey	12	20	<i>Eucalyptus vicitrix</i> , <i>Acacia cyperophylla</i>
Midstorey	2.5	5	<i>Acacia tetragonophylla</i>	Midstorey	-	-	Nil
Understorey	0.4	2	<i>Maireana aphylla</i> , <i>Tecticornia doleiformis</i>	Understorey	-	-	Nil
Conservation Significant Flora: None				Conservation Significant Flora: None			

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix C – Detailed Flora and Vegetation Sites

Site: HSQ039		WP -(E) 661679		(N) 7181983		Site: HSQ040		WP -(E) 660090		(N) 7184182					
Date: 10/05/2026		WP-NW-(E) 661695		(N) 7181964		Date: 10/05/2026		WP-NW-(E) 660105		(N) 7184173					
Botanist: NP		WP-NE-(E) 661680		(N) 7181953		Botanist: NP		WP-NE-(E) 660096		(N) 7184158					
Site Type / Size: 20x20 Quadrat		WP-SE-(E) 661666		(N) 7181969		Site Type / Size: 20x20 Quadrat		WP-SE-(E) 660080		(N) 7184167					
		South 📍 174°S (T) ● 50 S 661678 7181980 ±7m ▲ 540m  WGR007 Horseshoe HSQ039 ref photo. APM Pty Ltd 10 May 2026 14:15:30						North East 📍 64°NE (T) ● 50 S 660082 7184159 ±3m ▲ 546m  WGR007 Horseshoe HSQ40 ref photo. APM Pty Ltd 10 May 2026 15:40:22							
		Seasonal Conditions:						Dry				Age Since Last Fire:		> 5 years	
		Soil Type:						Sand silt				Soil Colour:		Red	
		Surface Rocks Size/Shape:						0.01-10cm Gravel and small stones				Surface Rock Cover (%):		20%	
		Rock Type:						Ironstone				Rock Type:		Ironstone and quartzite	
Landform		Open flat ironstone plain		Landform		Flat open stony plain		Landform		Flat open stony plain					
Slope aspect		Flat		Slope aspect		Flat		Slope aspect		Flat					
Vegetation Description		Very open acacia woodland		Vegetation Description		Sparse low acacia woodland with mixed shrub understorey		Vegetation Description		Sparse low acacia woodland with mixed shrub understorey					
Condition		Poor		Condition		Good		Condition		Good					
Disturbances		Historic clearing, over grazing		Disturbances		None		Disturbances		None					
Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species	Strata	Height (m)	Cover (%)	Species				
Overstorey	4	2	<i>Acacia pruinocarpa</i> , <i>Acacia aptaneura</i>	Overstorey	4.5	5	<i>Acacia aptaneura</i>	Overstorey	4.5	5	<i>Acacia aptaneura</i>				
Midstorey	-	-	Nil	Midstorey	-	-	Nil	Midstorey	-	-	Nil				
Understorey	0.4	0.1	<i>Ptilotus obovatus</i> , <i>Sclerolaena cuneata</i>	Understorey	1.2	5	<i>Eremophila spectabilis</i> , <i>Eremophila galeata</i>	Understorey	1.2	5	<i>Eremophila spectabilis</i> , <i>Eremophila galeata</i>				
Conservation Significant Flora: None				Conservation Significant Flora: None				Conservation Significant Flora: None							

Appendix D: Flora Species by Site Matrix

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA

Appendix D - Flora species by site matrix

Family	Species	Status	HSQ01	HSQ02	HSQ03	HSQ04	HSQ05	HSQ06	HSQ07	HSQ08	HSQ09	HSQ10	HSQ11	HSQ12	HSQ13	HSQ14	HSQ15	HSQ16	HSQ17	HSQ18	HSQ19	HSQ20	HSQ21	HSQ22	HSQ23	HSQ24	HSQ25	HSQ26	HSQ27	HSQ28	HSQ29	HSQ30	HSQ31	HSQ32	HSQ33	HSQ34	HSQ35	HSQ36	HSQ37	HSQ38	HSQ39	HSQ40						
Acanthaceae	<i>Harnieria kempeana</i> subsp. <i>muelleri</i>			0.1																																												
Amaranthaceae	<i>Ptilotus rotundifolius</i>																					0.1		0.1	0.1			0.1		0.1																		
	<i>Ptilotus obovatus</i>		0.5	5	0.5	0.5	0.1	0.1		0.1	0.1		0.1				0.5		0.1	2	5	0.5		0.1	0.5								0.1	0.1	0.5		0.5	0.1		0.1								
	<i>Ptilotus schwartzii</i>		0.5	0.5			0.1			0.5			1			0.1		0.5	0.1		0.1					0.1	0.1				0.1	0.1						0.1										
Apocynaceae	<i>Leichhardtia australis</i>		0.1			0.1																	0.5																									
	<i>Vincetoxicum lineare</i>																																					0.1										
Boraginaceae	<i>Euploca ovalifolia</i>				1																	1															0.5											
Chenopodaceae	<i>Enchylaena tomentosa</i>			0.1																															0.1		0.5	0.1										
	<i>Maireana aphylla</i>											0.1																						0.1			0.1		0.1									
	<i>Maireana</i> sp.							0.1																													0.1											
	<i>Maireana triptera</i>											0.1																							0.1	0.1			0.1		0.1							
	<i>Rhagodia eremaea</i>			0.1		0.1										0.1					2		1			0.1															0.1	0.1						
	<i>Sclerolaena cuneata</i>												0.1								0.5											0.1	0.1		0.1					0.5	0.1							
	<i>Tecticornia doleiformis</i>												0.1																						2	5				0.5								
	<i>Atriplex vesicaria</i>																																					0.1										
Cleomaceae	<i>Arivela viscosa</i>										0.1																										0.1											
Convolvulaceae	<i>Duperreya sericea</i>																0.1	0.1		0.1																												
Fabaceae	<i>Acacia aneura</i>																																															
	<i>Acacia aptaneura</i>		20	25	3	5	20	5	10		20		2	10	10	2	1	10	10		15		25	1	5	10	2	2	0.5		2		5	2	1	20	10	10				2	20					
	<i>Acacia citrinoviridis</i>					2			5											2																		1			1							
	<i>Acacia craspedocarpa</i>							10																																								
	<i>Acacia cuspidifolia</i>																																															
	<i>Acacia cuthbertsonii</i>							2				4									1	2					0.5									15		2										
	<i>Acacia cyperophylla</i>													20	5		20				25								35												10							
	<i>Acacia fuscaneura</i>												1										0.5																									
	<i>Acacia kempeana</i>														0.1	5		2															0.1										0.1					
	<i>Acacia marramamba</i>		0.5	0.5		1																				2		1																				
	<i>Acacia pruinocarpa</i>					5	5									5		5		5	5		5	0.1	2	10				0.1	10	5				0.1						10						
	<i>Acacia quadrimarginea</i>																				2																											
	<i>Acacia ramulosa</i> var <i>linophylla</i>											2																																				
	<i>Acacia rhodophloia</i>				2										2								2	0.5	5		2			0.5		0.1	1															
	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>						2		0.1				2																											10	2							
	<i>Acacia sibirica</i>													0.1																0.5																		
	<i>Acacia tetragonophylla</i>												0.1		5	2	0.5	2		0.1	0.1			15	1								1	0.1	0.5		0.1	0.1	1					2.5				
	<i>Indigofera ?gilesii</i>	?P3				0.1																															0.1											
	<i>Senna artemisioides</i> subsp. <i>artemisioides</i>																																															
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>					1	0.5																1	2	0.1	0.5				0.1						0.1									0.1			
	<i>Senna artemisioides</i> subsp. <i>xsturtii</i>		0.1	0.5	1			0.1								0.5		0.5									0.1	0.1	0.1	0.1		0.1	0.1		0.5	2	0.5	0.1	0.1		0.5		0.1	0.1				
	<i>Senna charlesiana</i>		0.1																																													
	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i>		0.1			0.1	0.5								0.1							0.1				0.1															0.1							
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>													0.1																																		
	<i>Senna glutinosa</i> subsp. <i>xluerssenii</i>		0.1	0.1									0.1									0.1		0.1				0.1		0.1							0.1	0.5	1	0.1	0.5		0.1	0.5		0.1	0.5	
Frankeniaceae	<i>Frankenia pauciflora</i>																																															

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA

Appendix D - Flora species by site matrix

Family	Species	Status	HSQ01	HSQ02	HSQ03	HSQ04	HSQ05	HSQ06	HSQ07	HSQ08	HSQ09	HSQ10	HSQ11	HSQ12	HSQ13	HSQ14	HSQ15	HSQ16	HSQ17	HSQ18	HSQ19	HSQ20	HSQ21	HSQ22	HSQ23	HSQ24	HSQ25	HSQ26	HSQ27	HSQ28	HSQ29	HSQ30	HSQ31	HSQ32	HSQ33	HSQ34	HSQ35	HSQ36	HSQ37	HSQ38	HSQ39	HSQ40		
Goodeniaceae	<i>Scaevola spinecens</i>											0.5											0.5											0.5		0.5		0.5						
Laminaceae	<i>Teucrium teucriiflorum</i>												0.1																															
Loranthaceae	<i>Amyema fitzgeraldii</i>				0.1																																							
Malvaceae	<i>Abutilon oxycarpum</i>													0.5																														
	<i>Hibiscus</i> sp. Gardneri (A.L. Payne PRP1435)																0.1																											
	<i>Hibiscus sturtii</i>			0.1		1																																0.1						
	<i>Sida calyxhymenia</i>					0.5																																						
	<i>Sida ectogama</i>					1			0.5						0.1	0.5		0.1			0.5			10																0.1			2	
Myrtaceae	<i>Corymbia candida</i>																			0.1																								
	<i>Corymbia ferriticola</i>		5																																									
	<i>Eucalyptus victrix</i>																																							5				
Poaceae	<i>Aristida inequiglumis</i>													0.1	0.1																													
	<i>Cymbopogon obtectus</i>													0.1	0.1																													
	<i>Eriachne mucronata</i>							0.1	2						0.1																													
Proteaceae	<i>Grevillea berryana</i>		0.1	5						0.5			1		2				0.5		2			0.1			0.5			0.1	0.1													
	<i>Hakea lorea</i>													0.1																														
	<i>Hakea priessii</i>																																	5										
Pteridaceae	<i>Cheilanthes sieberi</i>								20					2																														
Rubiaceae	<i>Psyrax latifolia</i>													0.1	0.5					0.1	0.5																							
	<i>Psyrax rigidula</i>								4								0.1	1	0.1	0.1	0.1		0.1								0.1						0.1							
	<i>Psyrax suaveolens</i>								0.1																																		0.1	
Sapindaceae	<i>Dodonaea pachyneura</i>		0.5			0.5																					0.5											2						
Scrophulariaceae	<i>Eremophila caespitosa</i>																										2																	
	<i>Eremophila compacta</i>												0.5			0.1	0.1	0.1	0.1					0.1	0.1	0.5				0.1					0.1	0.1					0.1			
	<i>Eremophila forrestii</i>		1																								2	0.1												0.5				
	<i>Eremophila galeata</i>					2							0.1		0.1		0.1				1	0.5	5	5	0.5				0.5				0.1		5			0.5				1		
	<i>Eremophila gilesii</i> subsp. <i>variabilis</i>											0.5																																
	<i>Eremophila glutinosa</i>																				0.1																							
	<i>Eremophila jucunda</i> subsp. <i>juncunda</i>		0.2				0.5	0.1	0.1																		1						0.1											
	<i>Eremophila latrobei</i>		0.5	0.1			1		0.1												0.1	1		0.1				0.1				0.1				0.1				0.1				
	<i>Eremophila macmillaniana</i>																																			0.1			0.1					
	<i>Eremophila obliquisejala</i>	P3							0.1	0.1																																		
	<i>Eremophila pantonii</i>											0.5																																
	<i>Eremophila spathulata</i>												0.1				0.5			2											0.1		0.5											
	<i>Eremophila spectabilis</i>		0.1	0.5		0.1	0.1	0.5											0.5		0.1	0.1		0.5	0.1				2	0.1				0.5	0.1	1			1				1	
Solanaceae	<i>Solanum cleistogamum</i>							0.1						0.1																														
	<i>Solanum lasiophyllum</i>		0.1	0.1					0.5					0.1	0.1			0.1									0.1										0.1							
Zygophyllaceae	<i>Tribulus suberosus</i>		0.5		10																	10	0.1		0.1	0.1		0.1						0.1		0.1								

Appendix E: Fauna Habitat Assessment Sites

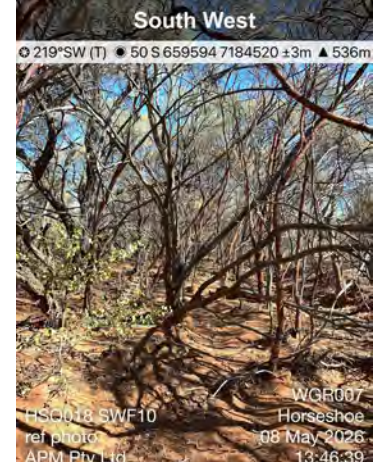
Basic Fauna Survey - Horseshoe Area
Appendix E - Fauna Habitat Assessments

Site	Habitat	Landform	Soil type	Veg structure	Veg. litter	Dominant veg type	Suitable breeding	Suitable foraging	Hollows	Water present	Disturbances	Last fire	Photo
HSSWF01	Southern White Face	Drainage	Gravel and rock	Tall dense acacia woodland	Yes	Acacia apteneura, prunicarpa and sclerosperma tall shrubs over Hibiscus and Sida understory	Yes - Large A. prunicarpa providing hollows in trunks. Some large enough for Egernia to occupy	Potentially - Drainage line was only 20m wide, but flowed into a confluence and continued around the base of the range.	Yes	No	Dust	Nil	Yes, Solocator 31/3
HSSWF02	Southern White Face	Drainage depression on flat plain	Ironstone	Acacia dense closed shrubland/woodland	Yes	Acacia apteneura, prunicarpa and citrinoviridis over Psyrax and various grasses, tall shrubs over Hibiscus and Sida understory	Yes - many large acacia, some with hollows forming.	Potentially - Grasses and shrubs were relatively dense but the grove is isolated	Yes	No	Cattle	Nil	Yes, Solocator 31/3
HSSWF05	Southern White Face	Drainage	Loam	Acacia dense shrubland	Yes	Acacia cyprofolia, apteneura and tetragonophylla	No - no hollows	Possible	No	No	Cattle	Nil	Solocator 8/05/2026
HSSWF06	Southern White Face	Drainage	Loam clay	Acacia dense shrubland		Acacia apteneura over Senna artemisoides	No - no hollows	No - no understory	No	No	Cattle	Nil	Solocator 8/05/2026
HSFS01	General	Quartz plain	Quartz stone and loam	Low open shrubland	No	Some Acacia prunicarpa over Eremophila species	No - quartz rock. No general fauna refuge. Some bark on old gidgee trees.	No - open and sparse	No	No	No	Nil	Solocator 8/05/2026
HSSWF07	Southern White Face	Outwash plain	Clay	Tall dense acacia woodland	Yes - thin	Acacia apteneura	No - Large trees but none have hollows	Possible - drainage sump has potential for grasses	No	No	Cattle and camel	Nil	Solocator 8/05/2026
HSSWF08	Southern White Face	Drainage	Gravel and rock	Open tall Acacia woodland	No	Acacia cyprofolia and tetragonophylla and Eremophila galeatea	No	No - sparse	No	No	Cattle	Nil	Solocator 8/05/2026
HSSWF09	Southern White Face	Grove plain	Loam	Tall moderately dense Acacia grove	No	Acacia apteneura and prunicarpa over Eremophila	No - trees too small for hollows	No - sparse	No	No	No	Nil	Solocator 8/05/2026
HSSWF10	Southern White Face	Drainage	Sand loam	Closed tall acacia woodland with mixed understory	Yes - moderate	Acacia cyprofolia and quadrimargata over Sida	Yes - hollows in large gidgee trees	Possible - if/when not heavily grazed	Yes	No	Cattle		Solocator 8/05/2026
HSSWF11	Southern White Face	Drainage sump/depression/grove	Clay	Dense Acacia woodland grove on open plain.	Yes	Acacia apteneura and prunicarpa over Rhagodia	No - no hollows	No	No	No	No	Nil	Solocator 8/05/2026
HSFS02	General	BIFF conical rise	Skeletal	Open low shrubland	No	Acacia rhodanophloia over Eremophila galeatea, Tribulus and Ptilotus.	No caves but some large crevices	Foraging within rock boulders	No	No	No	Nil	Solocator 9/05/2026
HSSWF12	Southern White Face	Major/Minor drainage	Deep sand loam	Closed acacia woodland with mixed shrub understory.	Yes - abundant. Significant wrack and detritus	Acacia apteneura and prunicarpa over Acacia tetragonophylla and Eremophila, over sida and rhagodia	Yes - hollows located photos taken	Yes - in suitable conditions	Yes	No	Cattle	Nil	Solocator 9/05/2026
HSSWF13	Southern White Face	Outwash slope drainage	Stony loam	Open acacia woodland with mixed shrub understory	No	Acacia apteneura, prunicarpa and mamuliera and Eremophila, over senna	Possible - some hollows	No - too sparse	Yes	No	No	Nil	Solocator 9/05/2026
HSFS03	General	BIFF Ridge	Skeletal	Open acacia woodland with mixed shrub understory	No	Acacia apteneura and rhodanophloia over senna	Yes - small caves/crevices excavated out by echidna	Yes - within rocks and crevices	No	No	No	Nil	Solocator 9/05/2026
HSSWF14	Southern White Face	Drainage 2nd order.	Sand loam	Open tall Acacia woodland	No	Acacia cyprofolia and kempeana over eremophila	No	No - no structure	No	No	No	Nil	Solocator 9/05/2026
HSFS04	Night Parrot	Flood outwash run on plain east of B	Sand silt	Open acacia woodland with mixed shrub understory	No	Acacia apteneura over hakea and tecticornia species	No - no structure	No - sparse with few plants	No	No	No	Nil	No. Use quadrat HSQ33
HSFS05	Night Parrot	Flood outwash	Sand silt	Open acacia woodland with mixed shrub understory	No	Acacia apteneura over hakea and tecticornia species	No - no structure	No - sparse with few plants	No	No	No	Nil	Solocator 10/05/2026
HSFS06	General	Laterite breakaway	Laterite	Open acacia shrubland	No	Acacia apteneura over Eremophila spectabilis	Yes - Possible Long Tailed Dunnart burrow photographed, many large burrows and dug outs. Varanid/Echidna activity	Yes - complex structure.	No	No	No	Nil	Solocator 10/05/2026 Long ta
HSSWF15	Southern White Face	Drainage	Clay loam	Closed acacia shrubland with mixed understory		Acacia sclerosperma and tetragonophylla over mairenaea	No - no significant trees	No - no structure	No	No	No	Nil	Solocator 10/05/2026
HSFS07	General	Major drainage	Sand rock	Eucalyptus and Acacia open gallery forest	Yes - wrack	Eucalyptus camaldulensis and Acacia cyprofolia	Yes	Yes	Yes	Recent	Cattle	Nil	Solocator 10/05/2026

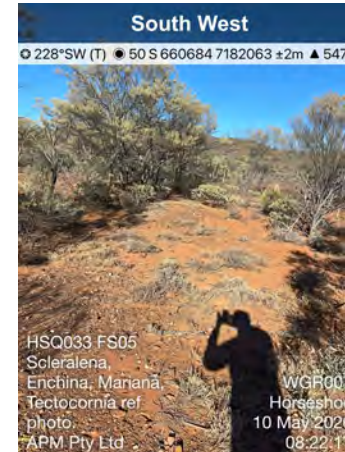
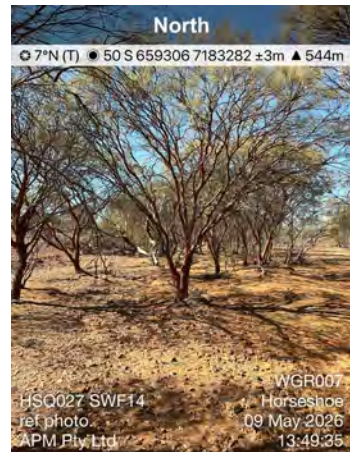
APPENDIX F: FAUNA HABITAT ASSESSMENT PHOTOS

DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix F – Fauna Habitat Assessment Site Photos

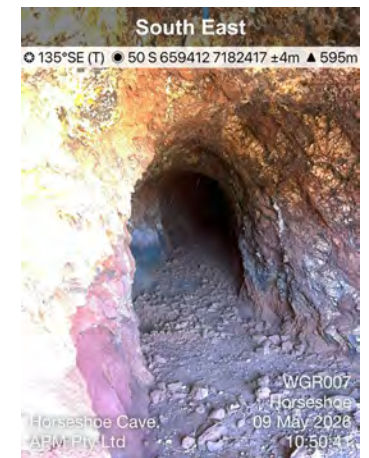
**Fauna Habitat
Assessment Sites**



DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix F – Fauna Habitat Assessment Site Photos



DETAILED FLORA AND VEGETATION SURVEY, BASIC FAUNA SURVEY – HORSESHOE AREA
Appendix F – Fauna Habitat Assessment Site Photos



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