HAVIERON MINE AND SERVICE INFRASTRUCTURE CORRIDOR TARGETED FLORA SURVEY

Newmont

ecoscape

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SUMMARY

Newmont NOL Pty Limited (NOL) operates the Telfer Gold Project in the Great Sandy Desert and is developing the Havieron Mine Site and Service Infrastructure Corridor. Following a request by the Environmental Protection Authority (EPA) for additional information, Ecoscape was commissioned to undertake targeted searches for significant flora within the proposed Havieron Mine and Service Infrastructure Corridor areas with a focus on *Goodenia hartiana* and an unresolved 'Myrtaceae sp.' that was previously identified as a potential new species.

The survey area included a development envelope of 3,448.40 ha with a proposed disturbance footprint of 527.18 ha.

The desktop assessment identified 20 conservation-listed flora with one known to occur (*Seringia exastia*, TF), one considered Likely to occur (*Goodenia hartiana*, Priority 2).

The field survey was undertaken during 19-23 August following a 6-month period of above average rainfall at Telfer and corresponded with the optimal flowering period documented for *Goodenia hartiana*. The field survey involved a combination of extensive traverses on foot, vehicle-based traverses and drone-assisted survey.

Three conservation-listed flora were recorded within the survey area including:

- *Seringia exastia* (listed as TF, though not considered of conservation significance, see **Section 4.1.1**): recorded from two populations of approximately 80 plants
- *Goodenia hartiana* (P2): 1,592 plants within the disturbance footprint, 2,191 within the broader development envelope and 2,827 plants outside of the survey area (6,610 total)
- *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (P2): a single plant recorded from the Havieron Mine area within the development envelope.

Potential impacts to these conservation-listed taxa are considered likely to be negligible based on the number of plants within the disturbance footprint and known local and regional distributions.

The previously unresolved 'Myrtaceae sp.' was recollected from the documented location outside the survey area with additional locations recorded within the survey area. All collections were confirmed to represent *Calytrix carinata*. Whilst there appear to be two morphotypes present, neither are considered to be of conservation significance.

1 INTRODUCTION

1.1 BACKGROUND

Newmont NOL Pty Limited (NOL) operates the Telfer Gold Project in the Great Sandy Desert and is developing the Havieron Mine Site and Service Infrastructure Corridor. These areas have been previously subject to Detailed flora and vegetation assessments (Strategen-JBS&G 2021a, 2021b). However, further survey prior to proposed clearance activities was considered desirable. In addition, the Environmental Protection Authority (EPA) Referral submitted for assessment resulted in a request by the EPA for additional information. Whilst the existing surveys were considered by NOL to be sufficient, targeted searches for significant flora were deemed suitable added to supplement the existing assessments. A particular emphasis was placed on targeted searches for *Goodenia hartiana* (Priority 2) that was considered as 'highly likely' to occur in the Service Infrastructure Corridor (Strategen-JBS&G 2021b) and 'may occur' within the Mine Site area (Strategen-JBS&G 2021a). The previous assessment of the Service Infrastructure corridor also identified a potential new species ('Myrtaceae sp.') at a location outside the current infrastructure corridor footprint, requiring additional survey/collections to resolve its correct taxonomic placement and potential significance.

Ecoscape was commissioned by Talis Consultants on behalf of NOL to undertake targeted searches for significant flora within the proposed Havieron Mine and Service Infrastructure Corridor areas with a focus on *Goodenia hartiana* and the unresolved 'Myrtaceae sp.'.

1.2 SURVEY AREA

The survey area is located within the Shire of East Pilbara in the Great Sandy Desert bioregion, approximately 410 km southeast of Port Hedland (**Figure 1**). The total extent of the development envelope is 3,448.40 ha with a proposed disturbance footprint of 527.18 ha.

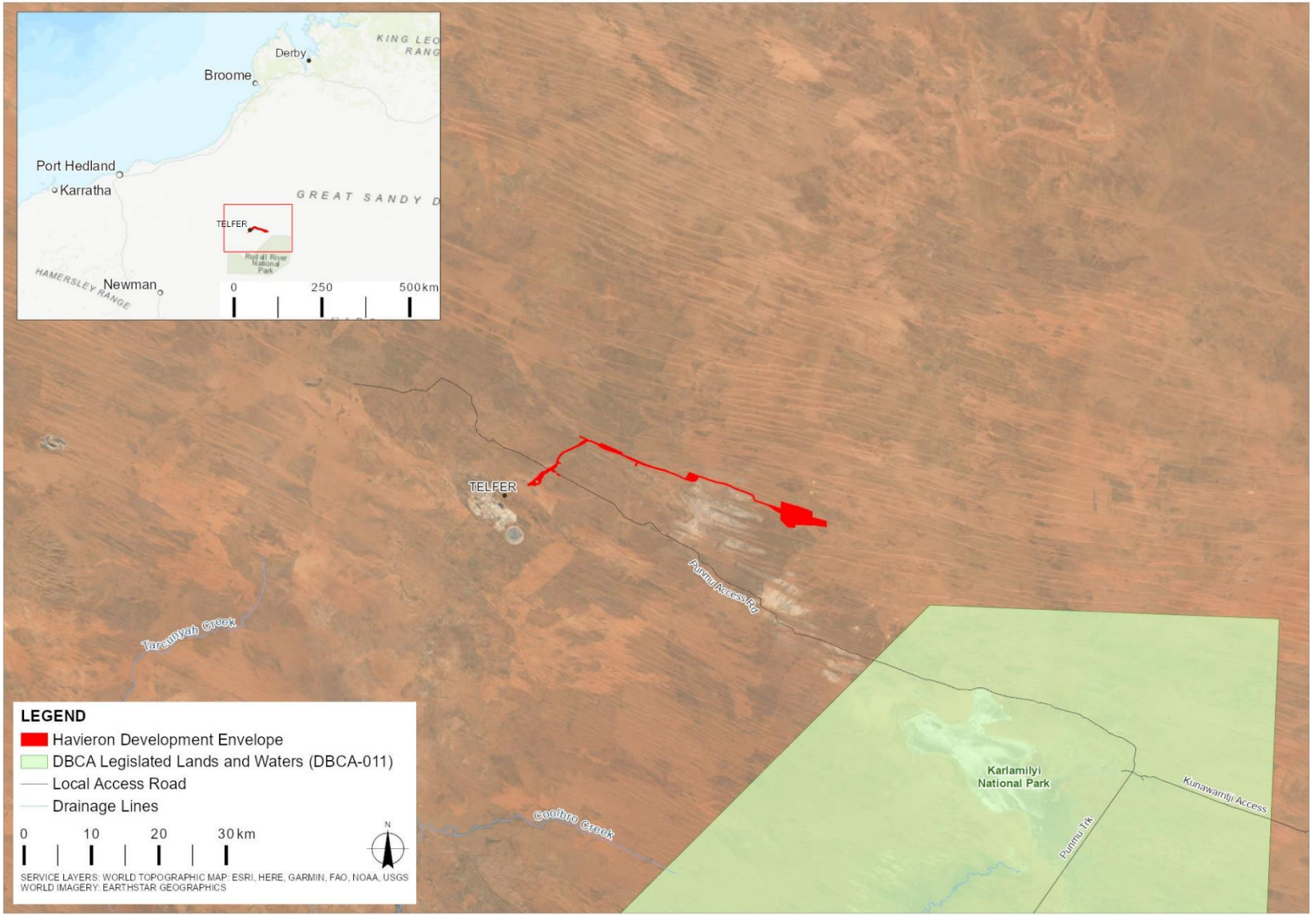


Figure 1: Survey area location

1.3 COMPLIANCE

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Western Australian *Environmental Protection Act 1986* (EP Act)
- Western Australian *Biodiversity Conservation Act 2016* (BC Act)
- Western Australian *Biodiversity Conservation Regulations 2018.*

As well as those listed above, the assessment complied with EPA requirements for environmental survey and reporting in Western Australia, as outlined in:

- EPA (2016a) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, known herein as the Flora and Vegetation Technical Guidance
- EPA (2016b) *Environmental Factor Guideline – Flora and Vegetation*
- EPA (2021) *Statement of environmental principles, factors, objectives and aims of EIA*.

Additional details (definitions and criteria) relevant to these works are available in **Appendix One**.

2 DESKTOP ASSESSMENT

2.1 PHYSICAL ENVIRONMENT

2.1.1 CLIMATE

The closest Bureau of Meteorology (BoM) station with long term records is Telfer Aero (BoM 2024a station 13030, operating since 1974) which is located within close proximity to the western end of the survey area. The mean annual rainfall is 363.8 mm with 76.3% falling from December to March. The rainfall during the 6-month period prior to the field survey was 142.1% of the long-term average for this period with particularly high rainfall recorded during March 2024.

December is the hottest month with a mean maximum temperature of 40.5°C and minimum of 25.7°C. June is the coldest month with a mean maximum of 25.4°C and minimum of 12.0°C.

Figure 2 shows the average rainfall and temperatures of the survey area, with rainfall for the 6 months preceding the field survey.

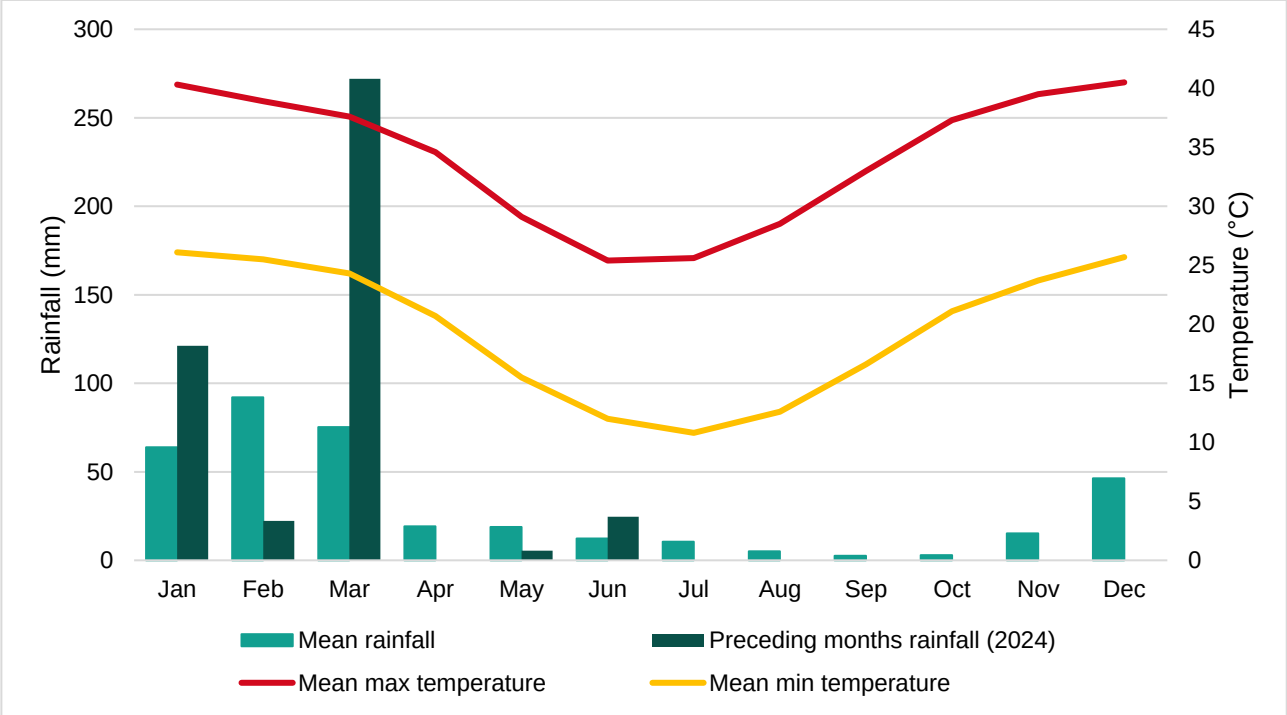


Figure 2: Mean rainfall and temperature (Telfer Aero) (BoM 2024b)

2.2 BIOLOGICAL ENVIRONMENT

2.2.1 BIOGEOGRAPHIC REGION

Biogeographic regions are delineated on the basis of similar climate, geology, landforms, vegetation and fauna and are defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (Department of Agriculture Water and the Environment 2020).

The survey area is located in the Great Sandy Desert IBRA region in the Mackay subregion (GSD2), described by Kendrick (2001) as:

> *Tropical inland 'red-centre' desert. Includes 'Percival' and 'Auld' palaeoriver systems. Mainly tree steppe grading to shrub steppe in south; comprising open hummock grassland of Triodia pungens and Triodia schinzii with scattered trees of Owenia reticulata and bloodwood (Corymbia spp.), and shrubs of Acacia spp., Grevillea wickhamii and G. refracta, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus*

Basins. Casuarina decaisneana (Desert Oak) occurs in the south and east of the region. Gently undulating lateritised uplands support shrub steppe such as Acacia pachycarpa shrublands over Triodia pungens hummock grass. Calcrete and evaporite surfaces are associated with occluded palaeo-drainage systems that traverse the desert; these include extensive salt lake chains with samphire low shrublands, and Melaleuca glomerata - M. lasiandra shrublands. Monsoonal influences are apparent in the north-western sector of this region. The climate is arid tropical with summer rainfall. Subregional area is 18, 636, 695 ha.

2.2.2 PRE-EUROPEAN VEGETATION

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia at a scale of 1:250,000 in the south-west and at a scale of 1:1,000,000 in less developed areas.

Beard's vegetation maps attempted to depict the native vegetation as it was presumed to be at the time of settlement and is known as the pre-European vegetation type and extent. Beard's vegetation maps have since been developed in digital form by Shepherd, Beeston & Hopkins (2002), updated by DPIRD (2019) and published by the DBCA (2019). This mapping indicates that the survey area intersects two pre-European vegetation units:

- Association 134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills
- Association 157: Hummock grasslands, grass steppe; hard spinifex, *Triodia wiseana.*

2.2.3 PREVIOUS VEGETATION MAPPING

There are nine vegetation types that intersect the survey area based on the previous assessments (Strategen-JBS&G 2021a, 2021b):

- **3c**: *Acacia* spp. High Shrubland over *Acacia stellaticeps* Low Open Shrubland over *Triodia* aff. *basedowii* Hummock Grassland
- **4b**: Scattered Trees of *Corymbia* over *Acacia stipuligera, Grevillea wickhamii, Acacia stellaticeps, Jacksonia aculeata* and *Calytrix carinata* Low Open Shrubland over *Triodia basedowii* and *T. schinzii* Closed Hummock Grassland
- **6b**: *Grevillea wickhamii* Open Shrubland over *Acacia stellaticeps* and *Tribulus* spp. Low Open Shrubland over *Triodia epactia* Hummock Grassland
- **6e**: Fringing vegetation associated with Clay Pans. Typical community consists of *Acacia stellaticeps* over *Triodia epactia* and *Triodia basedowii*
- **6f**: *Acacia* spp. Tall open shrubland over *Acacia stellaticeps, Calytrix carinata, Jacksonia aculeata* Low Shrubland over *Triodia schinzii* Hummock Grassland
- **6g**: Scattered Tall Shrubs of *Grevillea wickhamii* and *Hakea chordophylla* over *Triodia* aff. *basedowii* Hummock Grassland
- **6i**: Scattered Trees of *Eucalyptus victrix* over *Acacia cuthbertsonii* subsp. *cuthbertsonii* and *Senna artemisioides* subsp. *oligophylla* Open Shrubland over *Triodia schinzii* Hummock Grassland
- **6j**: Scattered Trees of *Melaleuca glomerata* over *Tecticornia* and *Cyperus squarrosus*, *Eragrostis falcata*
- **6k**: Tall *Acacia* over mixed heath over *Eragrostis setifolia* and *Triodia epactia.*

2.2.4 THREATENED AND PRIORITY FLORA

The DBCA database search of conservation-listed flora (search reference 54-0724FL) was conducted using a 100 km buffer around the supplied shapefiles. The results incorporate the TPFL List, taken from Threatened and Priority Flora Report Forms and DBCA surveys, and WA Herb, taken from vouchered specimens held in the Western Australian Herbarium. Newmont also supplied GIS data of their significant flora database. **Map 1** shows the locations of conservation-listed flora identified by the combined database searches.

The combined database searches identified 20 conservation-listed flora taxa, listed in **Table 1**, consisting of one TF, five P1, four P2, nine P3 and one P4.

Table 1: Flora database search results, habitat and likelihood assessment

Dark blue shading indicates known from the survey area, light blue indicates likely to occur or may occur within the survey area

Source	Species name	Habitat	Flowering	Distance to nearest (km)	Likelihood of occurrence (desktop)
	Threatened Flora				
N	*Seringia exastia*	Various, sandplains, rocky hills	Apr-Dec	0	Known
	DBCA Priority 1				
WAH, TP	*Eremophila tenella*	Stony hillsides	May, Aug-Sep	22.4	Unlikely
WAH	*Goodenia pedicellata*	Rocky slopes or crests	Apr-Jun	106.4	Highly unlikely
WAH, TP	*Lepidium amelum*	Stony calcareous soils	May-Aug	106.7	Highly unlikely
WAH	*Ptilotus wilsonii*	Rocky hills	Oct	63.2	Unlikely
WAH	*Tecticornia enodis*	Salt lakes	-	90.9	Highly unlikely
	DBCA Priority 2				
WAH	*Acacia auripila*	Rocky quartz hills, gullies	Aug	89.4	Highly unlikely
WAH, TP, N	*Goodenia hartiana*	Sand dunes, swales	Aug-Sep	5.0	Likely
WAH	*Thysanotus* sp. Desert East of Newman (R.P. Hart 964)	Sandplain	Aug-Oct	60.1	Unlikely
WAH	*Triodia infesta*	Flats, dunes or rocky hilltops	-	97.7	Highly unlikely
	DBCA Priority 3				
WAH, TP	*Comesperma sabulosum*	Sand dunes, swales	Apr-Aug	58.6	Unlikely
WAH, TP	*Dampiera atriplicina*	Sand dunes	May, Jul	107.8	Highly unlikely
WAH	*Eragrostis lanicaulis*	Sand dunes, depressions, drainage channels, limestone rises	May, Aug-Oct	105.9	Highly unlikely
WAH, TP	*Euphorbia clementii*	Poorly known	-	105.1	Highly unlikely
WAH	*Fuirena incrassata*	Streams and seasonally wet areas	May-Aug	109.8	Highly unlikely
WAH	*Indigofera ammobia*	Mostly from red sand	Sep	70.7	Unlikely
WAH	*Pterocaulon xenicum*	Open plains	-	15.1	May occur
WAH	*Synostemon arenosus*	Sand dunes	May-Aug	107.6	Unlikely
WAH	*Triodia* sp. Mt Ella (M.E. Trudgen 12739)	Creeklines or rocky slopes	-	103.8	Highly unlikely
	DBCA Priority 4				
WAH	*Ptilotus mollis*	Steep rocky hills	May, Sep	74.7	Highly unlikely

* WAH = herbarium record (vouchered specimen)

TP = Threatened and Priority Flora Report Form record; may be unconfirmed i.e. without vouchered specimen

N = Newmont significant flora database

2.2.4.1 Threatened and Priority Flora Likelihood Assessment

Ecoscape conducted a likelihood assessment to identify the conservation-listed flora taxa that have potential to occur within the survey area. Information to assess the likelihood of a species occurring includes ecology as listed on *FloraBase* (WAH 1998a-2024) or in more detailed sources (Department of Parks and Wildlife and Rio Tinto 2015; Sage & Albrecht 2006) incorporating an assessment of habitats likely to be present in the survey area.

The attributes taken into consideration were:

- broad soil type usually associated with the species
- broad landform usually associated with the species

- usual vegetation (characteristic species) with which the species is usually associated
- species having previously been recorded near the survey area ('proximity' or 'close proximity'; see **Table 2**) taking locational accuracy into consideration
- time since recorded (i.e. within the previous 25 years), taking into consideration land use changes since collection
- reliability of record: species identified by only a TPFL record, without an accompanying verified vouchered specimen, may have been incorrectly identified or been subject to taxonomic updates since the record was entered
- number of records for the species
- if the record is for a none naturally occurring population (planted).

The likelihood rating is assigned using the categories listed in **Table 2**.

Table 2: Categories for likelihood of occurrence of TF and PF

Likelihood Category	Criteria
Known to occur	Species previously recorded within the survey area.
Likely to occur	Suitable habitat is known to occur within the survey area and multiple records of the species exist within close proximity*
May occur	Suitable habitat is expected to occur within the survey area and the species has previously been recorded within proximity**
Unlikely to occur	Suitable habitat is expected to occur within the survey area however previous records are limited and/or historic and/or not in proximity** OR Suitable habitat is not expected to occur within the survey area although previous records exist in proximity**
Very Unlikely to occur	Suitable habitat is not expected to occur in the survey area AND/OR previous records are limited and/or historic and/or not in proximity**

* close proximity = 25 km (¼ of the distance of the database search buffer)
** proximity = 50 km (½ of the distance of the database search buffer)

The likelihood assessment is available in **Table 1**. One conservation-listed species, *Seringia exastia*[1] (EPBC Act TF) has been previously recorded (Strategen-JBS&G 2021b) from within the survey area (**Map 1**). One P2, *Goodenia hartiana*, was considered likely to occur based on suitable habitat present (sand dunes and swales) and close proximity to known locations (5.0 km). *Pterocaulon xenicum* (P3) was considered 'may occur' based on proximity (15.1 km) and potentially suitable habitat present. These species were prioritised for field survey.

The likelihood of occurrence was re-evaluated following the field survey when actual survey area characteristics (vegetation types, vegetation condition, visibility for individual species) were better understood and the level of survey effort was considered. The post-survey likelihood is also incorporated into this table and discussed further in **Section 5.2**.

2.2.4.2 Other Significant Flora

The previous assessment of the infrastructure corridor (Strategen-JBS&G 2021b) identified a taxon considered to have potential to represent a new species or large range extension. This taxon, identified as 'Myrtaceae sp.', was considered most likely to be from the genus *Calytrix* based on old flowering parts. However, collected material was insufficient for an identification to species level. This taxon was recorded from a single location outside the footprint of the current survey area. This taxon was included for both recollection of material at the known location as well as targeting within the survey area.

[1] *Seringia exastia* is a widespread species that retains a listing based on outdated taxonomy only, see **Section 4.1.1**.

2.3 RELEVANT LITERATURE

2.3.1 PREVIOUS SURVEYS

The survey area has been subject to previous surveys as follows:

- Strategen JBS&G (2021a) *Detailed Flora and Vegetation Assessment: Havieron Project Area*. This survey, that included targeted searches, did not identify any *Goodenia hartiana* plants. However, large areas were recently burnt and this species was still considered to have potential to occur.
- Strategen JBS&G (2021b) *Detailed Flora and Vegetation Assessment: Havieron Infrastructure Corridor. Goodenia hartiana* was identified as potentially occurring based on habitat preference, though was not recorded during the field assessment despite targeted searches undertaken. This survey did record the 'Myrtaceae sp.' that was considered to have potential to represent a new species.
- Strategen JBS&G (2020) *Reconnaissance Flora and Vegetation Assessment: Havieron Access Corridor. Goodenia hartiana* was identified as potentially occurring based on habitat preference, though was not recorded during the field assessment.

2.3.2 OTHER LITERATURE

The following documents were reviewed with relevance to the current survey:

- Sage & Albrecht (2006) *New taxa of Goodenia section Caeruleae subsection Scaevolina (Goodeniaceae) from the Eremaean Botanical Province of Western Australia.* This publication formally described *Goodenia hartiana* as a distinct species. It identified the habitat preference of *Goodenia hartiana* to be sand dune swales and sandy areas. The flowering period was identified as August and September, likely dependent on adequate rainfall.
- Spectrum Ecology Pty Ltd (2022a) *Havieron-Telfer Project: Desktop Flora Assessment*. This report, documenting a survey area in close proximity, identified that *Goodenia hartiana* was present from sand dune swales and sand hills.
- Spectrum Ecology Pty Ltd (2022b) *Goodenia hartiana Targeted Assessment*. A targeted survey for *Goodenia hartiana* of a 9,540 ha area around the Telfer Mine as well as a local population assessment in the surrounding area. This survey identified 9,081 *Goodenia hartiana* plants from four distinct populations of which 764 individuals (8.4%) were recorded within the survey area.
- Syrinx Environmental (2010) *Goodenia hartiana Survey Telfer*. A regional study to determine the distribution of *Goodenia hartiana* surrounding the Telfer mine. The report identified 11,000 plants that were known to exist and an additional 40,000 plants recorded during the survey for a total of 51,000 plants.
- Syrinx Environmental (2013) *Telfer Optimisation Project Flora and Fauna Survey*. This survey included searches for *Goodenia hartiana*.

3 METHODS

3.1 SURVEY AIMS

The aim of the Targeted survey was to undertake searches for significant flora with a particular focus on *Goodenia hartiana* (P2) and attempting to resolve the taxonomic status of the previously recorded 'Myrtaceae sp.'.

3.2 GUIDING PRINCIPLES

The flora and vegetation survey was conducted as a Targeted survey according to the Flora and Vegetation Technical Guidance (EPA 2016a). The EPA considers that a Targeted survey should:

- include one or more site visits
- be undertaken when the targeted flora/vegetation are most detectable and identifiable (in flower)
- include systematic searches for significant flora/vegetation
- map the full extent of the population outside of the predefined survey area
- include follow-up targeted surveys if required.

3.3 FIELD SURVEY

Conservation criteria used in this assessment are outlined in **Table 7** and **Table 8** in **Appendix One**.

Survey method details are outlined below.

3.3.1.1 Targeted Searches

Conservation-listed flora identified during the desktop analysis and previous surveys as known or having potential to occur were targeted for searches in areas of potential habitat. The most intensive searches were conducted in areas of suitable habitat or where target species were observed. The following techniques were undertaken as part of the targeted surveys:

- traverses on foot: the survey area was searched by traverses on foot with a focus on the development footprint areas and bases of sand dunes considered particularly likely to support *Goodenia hartiana*.
- vehicle-based traverses: undertaken by driving slowly along existing tracks with visual scans of surrounding vegetation and regular stops for ground-truthing. *Goodenia hartiana* plants were readily visible from the vehicle within approximately 10 m of the track.
- drone survey: a drone (Mavic Air 2) was frequently deployed as a method of rapidly mapping the extent of *Goodenia hartiana*, particularly outside the boundary of the survey area. *Goodenia hartiana* was found to be readily detectable using a drone from a height of approximately 20 m based on its vibrant green foliage that typically stood out from surrounding vegetation (**Image 1**). There were several similar appearing species from a distance (such as *Acacia stellaticeps*), however, identification was possible when observed from closer range (**Image 2**). All populations were ground-truthed from part of their range. Georeferenced photographs were taken, inspected to confirm identification using zoom and the number of plants within each image estimated.

Image 1: Drone-captured image of vegetation containing *Goodenia hartiana* (vibrant green plants)

Image 2: Drone-captured image of *Goodenia hartiana* at close range

The locations of conservation-listed taxa were recorded using a handheld GPS. Drone locations were recorded from georeferenced images that data was extracted from. The following data was recorded for conservation-listed flora:

- observer, date and time
- local abundance/population size, including outside the development envelopes where practical
- landform
- brief vegetation community description
- representative photos of each species and habitat
- collection of representative specimens.

3.3.1.2 Field Survey Timing

The field survey was conducted during 19-23 August 2024 which is outside the optimal period for a primary survey within the Great Sandy Desert bioregion according to the Flora and Vegetation Technical Guidance (EPA 2016a). However, for the purposes of the targeted survey, timing was considered suitable to detect the majority of species identified by the desktop assessment considering the above average rainfall prior to survey.

3.3.2 DATA MANAGEMENT AND ANALYSIS

3.3.2.1 Taxonomic Plant Identification

Any plants that could not be identified with certainty in the field, having potential to be conservation-listed, introduced species and having significance according to the Flora and Vegetation Technical Guidance (EPA 2016a) were collected during the field survey using Western Australian Herbarium collecting protocols.

The majority of post-survey plant collection identification was undertaken by Ecoscape taxonomists (primarily Stephen Kern) using relevant literature, taxonomic keys and reference specimens held at the WA Herbarium, including seeking assistance from specialist taxonomists where necessary. Terry Macfarlane[2] of the WA Herbarium confirmed the identification of *Thysanotus* sp. Desert East of Newman (R.P. Hart 964). The identification of *Calytrix* collections were confirmed by the WA Herbarium via the formal identification service (Accession ACC/11066/E).

3.3.2.2 Post-survey Likelihood Assessment

Following the field survey, a post-survey likelihood assessment was conducted to identify conservation-listed species that have potential to occur on site. This assessment was based on survey results, survey effort and habitat identified within the survey area.

[2]Terry Macfarlane, taxonomist with the WA Herbarium and *Thysanotus* specialist.

4 FIELD SURVEY RESULTS

The Targeted flora survey was conducted by Stephen Kern (Principal Botanist, Flora Collecting Permit FB62000001-2); Threatened Flora Collecting Permit TFL2223-0088) and Madeline West (Ecologist) during 19-23 August 2024.

4.1 CONSERVATION-LISTED FLORA

4.1.1 THREATENED FLORA

One TF, *Seringia exastia*, listed under the Commonwealth EPBC Act but not the Western Australian BC Act, was recorded during the field survey. *Seringia exastia* was previously considered restricted in distribution to the Broome region and accordingly listed as Threatened Flora. However, a taxonomic revision concluded that collections identified as *Seringia exastia* were not distinct from a more widespread species, *Seringia velutina*. Therefore, the two species were lumped together as a single species that retained the *Seringia exastia* name. *Seringia exastia* was subsequently removed from the BC Act list of Threatened Flora but has yet to be formally removed from the EPBC Act list. Hence, while now considered a common and widespread species, it remains listed as EPBC Threatened Flora. Considering the above, *Seringia exastia* was not a particular focus of the survey and was recorded opportunistically when encountered.

Locations of TF are indicated on **Map 2** and **Table 9** in **Appendix Two**, and described in more detail in **Table 3**.

Table 3: TF recorded during the field survey

***Seringia exastia* (TF)**	
Description: According to *FloraBase* (WAH 1998b-2024, 2024), *Seringia exastia* is a shrub to 1 m tall with purple flowers. 	**Habitat:** sandplains **Location:** isolated locations from both mine and infrastructure corridor areas **Survey results**: 80 plants from two records within the disturbance footprint **Populations:** two populations within the survey area **Known records and distribution**: According to *Atlas of Living Australia* (ALA 2024), there are 336 records of this species from Western Australia, Northern Territory and South Australia, with an overall distribution of approximately 1,700 km (north-south) by 2,200 km (east-west).

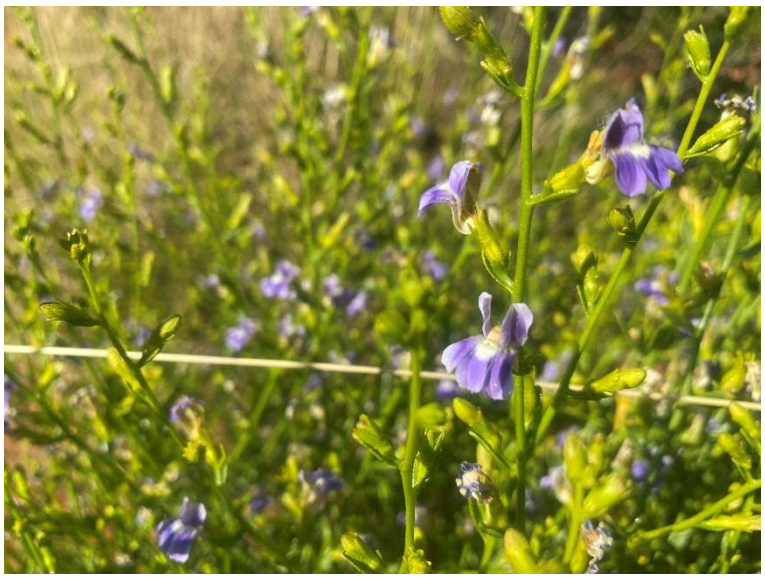
4.1.2 PRIORITY FLORA

Two PF were recorded during the field survey:

- *Goodenia hartiana* (P2)
- *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (P2).

Locations of PF are indicated on **Map 2** and **Table 9** in **Appendix Two,** and described in more detail in **Table 4** below.

Table 4: PF recorded during the field survey

***Goodenia hartiana* (P2)**	
Description: According to Sage & Albrecht (2006)**,** *Goodenia hartiana* is an erect or spreading, multi-stemmed perennial herb or shrub with blue or purple flowers. This description is consistent with field observations.  	**Habitat:** typically dune bases and swales, sometimes sandplains **Location:** large population near the western end of the infrastructure corridor and smaller population within the Havieron mine area **Survey results**: 1,592 plants within the disturbance footprint, an additional 2,191 plants within the extended development envelope and 2,827 plants recorded outside of the survey area (total of 6,610 plants) **Populations:** two populations within the survey area **Known records and distribution**: According to ALA (2024) there are 31 records of this species with an overall distribution of approximately 300 km (north-south) by 250 km (east-west), largely restricted to the Great Sandy Desert bioregion.

***Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (P2)**	
Description: According to *FloraBase* (WAH 1998b-2024, 2024), *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) is a perennial herb with tuberous roots and purple flowers. It is distinguished by its long, equal anthers and pseudo-cymose branching of the inflorescence. 	**Habitat:** recorded from near the base of a sand dune **Location:** within the Havieron Mine area in the development envelope but outside the disturbance footprint **Survey results**: one plant observed in the development envelope **Populations:** one population **Known records and distribution**: According to ALA (2024) there are seven records of this species from the Great Sandy Desert, Gascoyne, Gibson Desert and Little Sandy Desert bioregions, with an overall distribution of approximately 600 km (north-south) by 900 km (east-west).

4.1.2.1 Flora of Taxonomic Interest

Collections of *Calytrix* spp. were made to clarify the identity of the taxon considered to represent a potential new species ('Myrtaceae sp.') by the previous assessment (Strategen-JBS&G 2021b). The previous reported location outside the survey area was investigated and additional collections were made within the present survey area. All collections were subsequently identified by the formal WA Herbarium identification service as *Calytrix carinata*. However, it seems apparent that there are two distinct morphotypes of this species present. One morphotype has shorter leaves, narrower sepals and lighter coloured flowers (**Image 3** and **Image 4**), and matches the isotype of *Calytrix carinata*. The second morphotype has longer petiolate leaves, broader sepals and darker coloured flowers (**Image 5** and **Image 6**). Whilst initially seeming to represent distinct taxa, a review of the WA Herbarium collections includes both morphotypes represented under *C. carinata* including collections that are intermediate between the two. Therefore, it is concluded that the previously unidentified taxon should be considered as *Calytrix carinata*.

Image 3: Close up of *Calytrix carinata* (short-leaved morphotype) flowers and foliage

Image 4: *Calytrix carinata* (short-leaved morphotype) habit and habitat

Image 5: Close up of *Calytrix carinata* (long-leaved morphotype) flowers and foliage

Image 6: *Calytrix carinata* (long-leaved morphotype) flowers and habit

4.2 BOTANICAL LIMITATIONS

Survey design and type: Single phase, targeted survey for conservation-listed flora with extensive traverses.

A full summary of botanical limitations is presented in **Table 5**.

Table 5: Botanical limitations

Possible limitations	Constraints (yes/no): Significant, moderate or negligible	Comment
Availability of contextual information at a regional and local scale	No	Several surveys have been previously undertaken to provide context, sufficient for the purpose of a targeted survey.
Competence/experience of the team conducting the survey, including experience in the bioregion surveyed	No	The lead botanist conducting the field survey has 17 years botanical experience throughout Western Australia.
Proportion of the flora recorded and/or collected, and any identification issues	No	The survey was targeted with minimal identifications required. The majority of flora was flowering at the time of survey, hence target species could be readily identified.

Possible limitations	Constraints (yes/no): Significant, moderate or negligible	Comment
Was the appropriate area fully surveyed (effort and extent)	No	The proposed disturbance footprints were extensively traversed on foot and vehicle. In particular, suitable habitat to support likely conservation-listed flora was extensively traversed, particularly the bases of dunes.
Access restrictions within the survey area	No	All areas could be accessed where required.
Survey timing, rainfall, season of survey	No	The field survey was conducted during August 2024. Whilst not considered 'optimal' timing based on the Flora and Vegetation Technical Guidance, the majority of flora was observed to be in flower following above average rainfall prior to the survey. In particular, the survey timing corresponded with peak flowering of *Goodenia hartiana*, the primary focus of the targeted survey. The rainfall in the 6 months prior to the field survey was above the mean for this period (**Section 2.1.1**, **Figure 2**), also indicated by the rainfall deciles (**Figure 3** below). Therefore, for the purposes of this targeted survey, survey timing/season is not considered a limitation.
Disturbance that may have affected the results of the survey e.g. fire, flood, clearing	Yes- negligible	Several small areas had been recently burnt, potentially limiting the likelihood of detecting conservation-listed flora in these areas. However, similar unburnt habitats were present nearby that could be searched for such species.

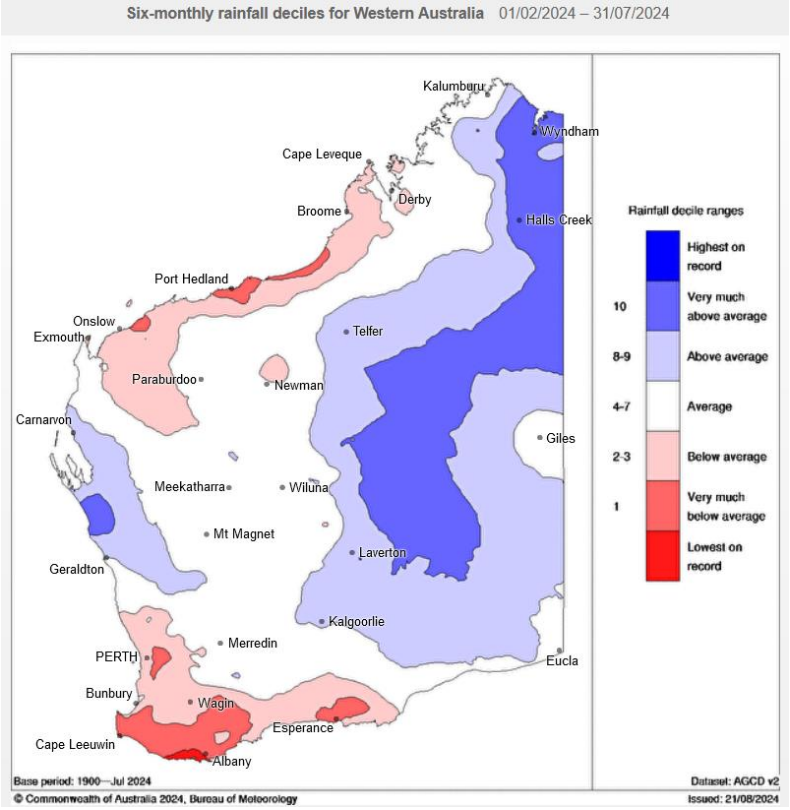


Figure 3: Rainfall deciles for the 6 months prior to the field survey (BoM 2024c)

5 DISCUSSION

5.1 FLORA SIGNIFICANCE

Whilst the focus of the survey was on *Goodenia hartiana*, all conservation-listed flora recorded are discussed in the following sections.

5.1.1 THREATENED FLORA

Seringia exastia, listed as Threatened Flora under the Commonwealth EPBC, was opportunistically recorded from two locations with an estimated 80 plants recorded from the survey area. As outlined in **Section 4.1.1**, this species has been removed from the BC Act following revised taxonomy (Binks RM 2020). However, it still awaits removal from the EPBC Act list of Threatened Flora. Prior to delisting from the BC Act list, the DBCA was providing the following advice with database search requests with regards to this species:

> *The search results include records for Seringia exastia. S. exastia (previous known as Keraudrenia exastia) was a species only known from the Kimberley Region. A recently completed taxonomic study that assessed genomic and morphological characters in several Seringia taxa (Binks & al. 2020) has concluded that Seringia exastia and S. elliptica are the same species. The taxonomy of the genus has been revised to synonymise S. exastia and S. elliptica under the oldest valid name of S. exastia. As S. elliptica is common and widespread throughout the Pilbara region, central WA and the Northern Territory and extends into South Australia, following the taxonomic revision S. exastia is now considered common and widespread.*
>
> *A nomination to delist the species due to no plausible significant threats to the species has been prepared and considered by the WA Threatened Species Scientific Committee (TSSC). We anticipate that at the next TSSC meeting recommendations will be made to the Minister to delist. However until changes are officially made to the threatened species list, S. exastia is still legally listed as threatened flora, and authorisation to take under section 40 of the Biodiversity Conservation Act 2016 is still required. Although some loss of plants is likely to have occurred and will continue to occur during mining and road works in some parts of the species' distribution, this is not expected to be significant in the context of the entire population. Therefore there should be no impediments to granting authorisation, following the standard process of application made to DBCA's Species and Communities Program.*
>
> *To reduce timeframes and costs associated with approvals under the BC Act, DBCA will not require the standard targeted surveys to be undertaken to inform the threatened flora authorisation impact assessment for Seringa exastia. However, survey reports should still consider Seringia exastia as a listed threatened species and note the presence of the species within a survey area when encountered. Authorisation applications with basic details that the species is known to occur within the applied project area will be accepted and fast-tracked for approval.*

Based on the above advice, *Seringia exastia* was not a particular focus of the survey as it is known to be widespread in Western Australia, extending into the Northern Territory and South Australia (**Figure 4**).

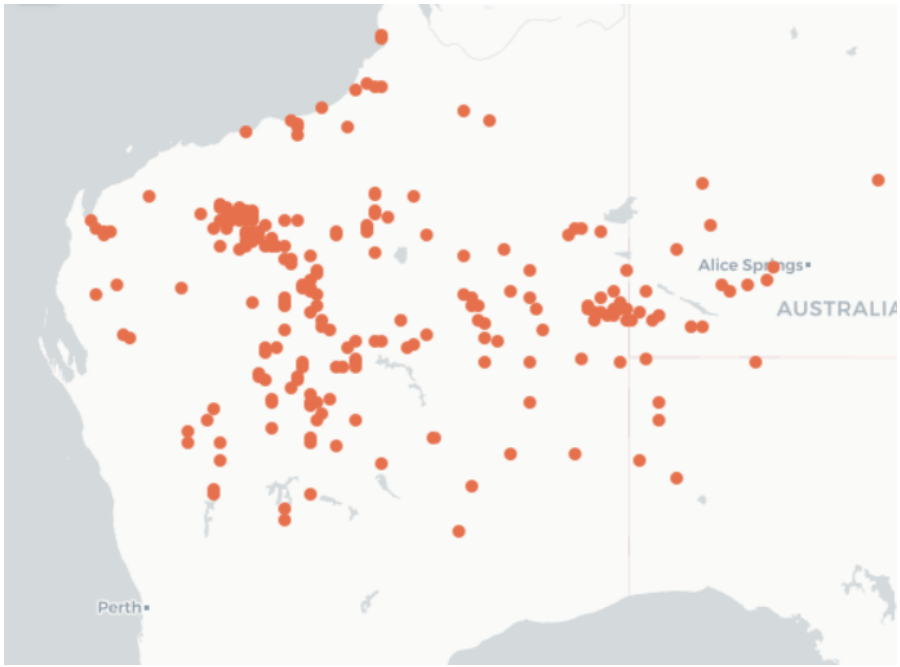


Figure 4: *Seringia exastia* distribution (ALA 2024)

5.1.2 PRIORITY FLORA

Two Priority 2-listed flora taxa were recorded during the field survey.

5.1.2.1 *Goodenia hartiana* (P2)

This taxon was the primary focus of the targeted searches due to the high likelihood of occurrence based on suitable habitat and proximity to known records. The field survey identified a large population near the western end of the infrastructure corridor and a smaller population within the Havieron mine area. A total of 6,610 plants were recorded, including 1,592 within the disturbance footprint and 2,827 plants within the broader development envelope.

Goodenia hartiana is known from an overall distribution of approximately 300 km (north south) by 250 km (east-west), largely restricted to the Great Sandy Desert bioregion (**Figure 5**). Several targeted surveys have been undertaken in the area surrounding Telfer including Syrinx Environmental (2010, 2013) that documented 51,000 plants and Spectrum Ecology (2022b) that documented 9,081 plants. Therefore, the population in the Telfer area, based on combined surveys (including this report), is presumed to be at least 67,000 plants. However, population size may fluctuate based on fire ecology and seasonal conditions (Spectrum Ecology Pty Ltd 2022b; Syrinx Environmental 2010).

The potential habitat to support *Goodenia hartiana* (sand dunes/swales) is extensive surrounding Telfer and the broader regional areas. Hence there is high potential for large regional populations of this species that have not been documented by previous surveys. Consequently, the potential impact on 1,592 plants within the disturbance footprint may be considered negligible and certainly not a threat to the continued existence of this species.

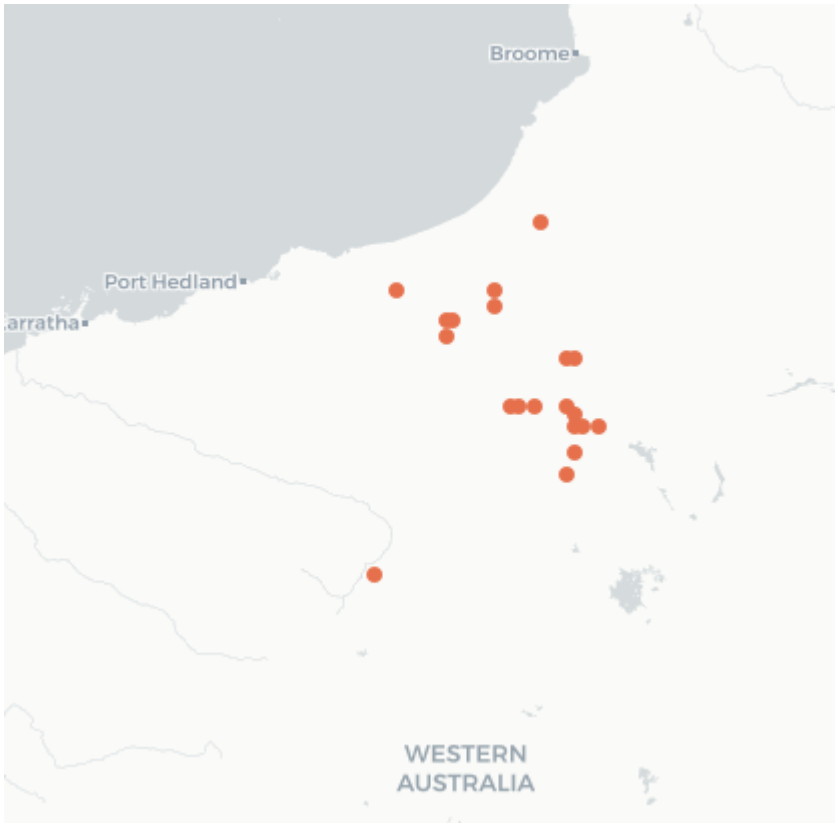


Figure 5: *Goodenia hartiana* distribution (ALA 2024)

5.1.2.2 *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (P2)

This taxon is yet to be formally described and is known by a 'phrase name'. One plant was recorded from within the Havieron Mine area, though not within the disturbance footprint. It has distinctive flowers characteristic of *Thysanotus* (fringe lilies) and consequently would have been easy to spot during traverses. This indicates that, whilst there is potential for additional isolated plants/populations within the survey area, it is likely to be uncommon (i.e. because only a single individual of a relatively conspicuous taxon was observed during extensive traverses/searches).

This taxon is known from scattered locations within the Gascoyne, Gibson Desert, Great Sandy Desert and Little Sandy Desert bioregions with a range of approximately 400 km (north-south) by 900 km (east-west). Considering the extensive geographical range of this taxon across a poorly surveyed region, it is considered unlikely that potential impacts to this taxon would be significant.

5.1.3 OTHER SIGNIFICANT FLORA

The 'Myrtaceae sp.' previously reported to represent a potential new species (Strategen-JBS&G 2021b) was confirmed to be a morphotype of *Calytrix carinata*. Whilst there appears to be two morphotypes of this species present within the survey area, both are well represented in the WA Herbarium collections and neither is considered to be of conservation significance.

5.2 POST-SURVEY LIKELIHOOD ASSESSMENT

The likelihood of conservation significant flora occurring in the survey area was revised following the field survey. This revised likelihood, that took into account vegetation condition, grazing and other disturbances, actual habitat availability and search effort, is included in **Table 6**. With the exception of the three conservation-listed taxa recorded (known) from the survey area, no other species listed in **Table 6** are considered likely to or may occur within the survey area (all unlikely or highly unlikely).

Table 6: Post-survey conservation-listed flora likelihood assessment

Species name	Pre-survey Likelihood of occurrence	Post-survey Likelihood of occurrence
Threatened Flora		
Seringia exastia	Known	Known
DBCA Priority 1		
Eremophila tenella	Unlikely	Highly unlikely
Goodenia pedicellata	Highly unlikely	Highly unlikely
Lepidium amelum	Highly unlikely	Highly unlikely
Ptilotus wilsonii	Unlikely	Highly unlikely
Tecticornia enodis	Highly unlikely	Highly unlikely
DBCA Priority 2		
Acacia auripila	Highly unlikely	Highly unlikely
Goodenia hartiana	Likely	Known
Thysanotus sp. Desert East of Newman (R.P. Hart 964)	Unlikely	Known
Triodia infesta	Highly unlikely	Highly unlikely
DBCA Priority 3		
Comesperma sabulosum	Unlikely	Unlikely
Dampiera atriplicina	Highly unlikely	Highly unlikely
Eragrostis lanicaulis	Highly unlikely	Highly unlikely
Euphorbia clementii	Highly unlikely	Highly unlikely
Fuirena incrassata	Highly unlikely	Highly unlikely
Indigofera ammobia	Unlikely	Unlikely
Pterocaulon xenicum	May occur	Unlikely
Synostemon arenosus	Unlikely	Unlikely
Triodia sp. Mt Ella (M.E. Trudgen 12739)	Highly unlikely	Highly unlikely
DBCA Priority 4		
Ptilotus mollis	Highly unlikely	Highly unlikely

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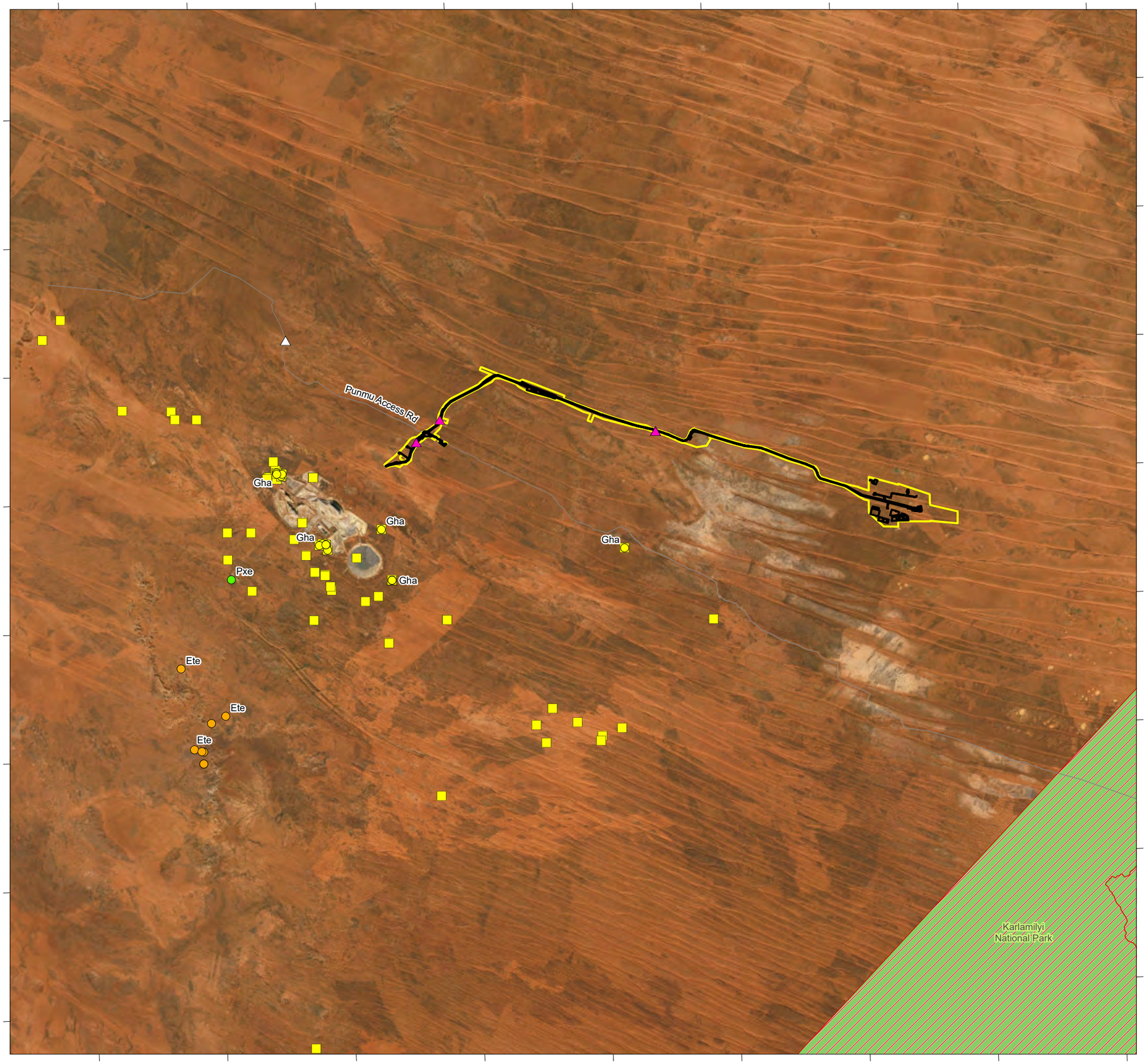
MAPS



LEGEND

- Havieron Development Envelope
- Havieron Infrastructure Polygon
- Environmentally Sensitive Areas (DWER-046)
- DBCA Legislated Lands and Waters (DBCA-011)

Conservation Significant Flora (DBCA, 2024)

- *Eremophila tenella* (P1)
- *Goodenia hartiana* (P2)
- *Pterocaulon xenicum* (P3)

Significant Flora Records (Newmont, 2024)

- Myrtaceae (Tribe Chamelauciae) sp.
- *Seringia exastia* (T)
- *Goodenia hartiana* (P2)

DATA SOURCES:
SOURCE DATA: HAVIERON DATA (TALIS, 2024). CONSERVATION SIGNIFICANT FLORA (DBCA, 2024). SIGNIFICANT FLORA RECORDS (TALIS, 2024). CLEARING REGULATIONS - ENVIRONMENTALLY SENSITIVE AREAS (DWER-046) (DWER 2021). DBCA - LEGISLATED LANDS AND WATERS (DBCA-011) (DBCA 2022). ROAD NETWORK (MRWA 2023).
IMAGERY: ESRI BASE MAP
SERVICE LAYERS: WORLD TOPOGRAPHIC MAP: ESRI, HERE, GARMIN, FAO, NOAA, USGS
WORLD IMAGERY: EARTHSTAR GEOGRAPHICS

ecoscape

CONSERVATION SIGNIFICANT FLORA RECORDS

HAVIERON MINE & SERVICE INFRASTRUCTURE CORRIDOR TARGETED FLORA SURVEY

talis consultants

COORDINATE SYSTEM: GDA2020 MGA ZONE 51
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA2020
UNITS: METER

N

SCALE: 1:300,000 @ A3

0 2 4 6 8 10 km

PROJECT NO: 5023-24

REV	AUTHOR	APPROVED	DATE
0	LC	SB	02/09/2024

MAP 01

1040000 1050000 1060000 1070000 1080000 1090000

7620000 7610000 7600000 7590000 7580000 7570000

Punmu Access Rd

Punmu Access Rd

LEGEND

- Havieron Development Envelope
- Havieron Infrastructure Polygon
- Survey Tracks

Conservation Significant Flora (Ecoscape, 2024)

- *Goodenia hartiana* (Priority 2)
- *Seringia exastia* (Threatened EPBC status)
- *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (Priority 2)

DATA SOURCES:
SOURCE DATA: HAVIERON DATA (TALIS, 2024). SURVEY RESULTS AND TRACKS (ECOSCAPE, 2024).
IMAGERY: ESRI BASE MAP
SERVICE LAYERS: WORLD TOPOGRAPHIC MAP: ESRI, HERE, GARMIN, FAO, NOAA, USGS
WORLD IMAGERY: EARTHSTAR GEOGRAPHICS
WORLD IMAGERY: MAXAR

ecoscape

CONSERVATION-LISTED FLORA LOCATIONS & SURVEY TRACKS

HAVIERON MINE & SERVICE INFRASTRUCTURE CORRIDOR TARGETED FLORA SURVEY

talis consultants

COORDINATE SYSTEM: GDA2020 MGA ZONE 51
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA2020
UNITS: METER

N

SCALE: 1:200,000 @ A3

0 1.5 3 4.5 6 7.5 km

PROJECT NO: 5023-24

REV	AUTHOR	APPROVED	DATE
0	LC	SB	30/09/2024

MAP 02

APPENDIX ONE LEGISLATIVE CONTEXT, DEFINITIONS AND CRITERIA

COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The EPBC Act is a legal framework to protect and manage matters of national environmental significance (MNES) including important flora, fauna, ecological communities and heritage areas listed under the Act.

Threatened taxa (flora and fauna) are protected under the EPBC Act, which lists species and ecological communities that have been assessed as meeting the criteria to be listed as Critically Endangered, Endangered, Vulnerable, Conservation Dependant, Extinct, or Extinct in the Wild, as detailed in **Table 7**.

Threatened Ecological Communities protected under the EPBC Act are categorised as Critically Endangered, Endangered or Vulnerable, also detailed in this table.

Migratory species subject to international agreements are also protected under the EPBC Act. The definition of a migratory species under the Act follows that prescribed by the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (DCCEEW 2023). The list of migratory species established under section 209 of the EPBC Act comprises:

- migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II);
- migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA)
- native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Table 7: EPBC Act categories for flora, fauna and ecological communities

Category	Threatened species	Threatened Ecological Communities
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.	n/a
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.	n/a
Critically Endangered (CR)	A native species is eligible to be included in the *critically endangered* category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the *critically endangered* category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria
Endangered (EN)	A native species is eligible to be included in the *endangered* category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the *endangered* category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

Category	Threatened species	Threatened Ecological Communities
Vulnerable (VU)	A native species is eligible to be included in the *vulnerable* category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the *vulnerable* category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.	n/a

WESTERN AUSTRALIAN ENVIRONMENTAL PROTECTION ACT 1986

The Western Australian EP Act was created to provide for an Environmental Protection Authority (the EPA) that has the responsibility for:

- prevention, control and abatement of pollution and environmental harm
- conservation, preservation, protection, enhancement and management of the environment
- matters incidental to or connected with the above.

The EPA is responsible for providing the guidance and policy under which environmental assessments are conducted. It conducts environmental impact assessments (based on the information provided by the proponent), initiates measures to protect the environment and provides advice to the Minister responsible for environmental matters.

WESTERN AUSTRALIAN BIODIVERSITY CONSERVATION ACT 2016

The Western Australian BC Act provides for the conservation, protection and ecologically sustainable use of biodiversity and biodiversity components in Western Australia.

Threatened Species

Threatened species (both flora and fauna) and ecological communities (see below) that meet the categories listed within the BC Act are protected under this legislation and require authorisation by the Minister to take or disturb. These are known as Threatened Flora, Threatened Fauna and Threatened Ecological Communities. The conservation categories of Critically Endangered, Endangered and Vulnerable are detailed in **Table 8**; these categories align with those of the EPBC Act. Some State-listed threatened species and ecological communities are provided with additional protection as they are also listed under the Commonwealth EPBC Act (see **Table 7** for conservation status category descriptions).

The most recent Western Australian flora and fauna listings were published in the Government Gazette on 6 October 2023 (Western Australian Government 2023a) and ecological communities listings on 26 May 2023 (Western Australian Government 2023b).

Priority-Listed Species

Flora are listed as PF where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to TF categories. Whilst PF are not specifically listed in the BC Act, some may qualify as being of special conservation interest and thereby have a greater level of protection than unlisted species.

There are three categories covering Western Australian-listed TF and four categories covering PF species which are outlined in **Table 8**. PF for Western Australia are regularly reviewed by the DBCA whenever new information becomes available, with species status altered or removed from the list when data indicates that they no longer meet these requirements.

Conservation significant fauna species are listed by the DBCA as Priority Fauna where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to threatened fauna categories. Whilst Priority Fauna are not specifically listed in the BC Act, these have a greater level of significance than other native species. The categories covering Priority Fauna species are outlined in **Table 8**.

Flora and fauna species may be listed as being of special conservation interest if they have a naturally low population, have a restricted natural range, are subject to or recovering from a significant population decline or reduction of range or are of special interest, and the Minister considers that taking may result in depletion of the species. Migratory species and those subject to international agreement are also listed under the Act. These are known as 'specially protected species' in the BC Act.

Table 8: Conservation category definitions for Western Australian flora and fauna (DBCA 2023)

Conservation Category Definitions for Western Australian Fauna and Flora	
Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such. **Categories of Threatened, Extinct and Specially Protected fauna and flora are:**	
T	**Threatened species** Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act). **Threatened fauna** is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species. **Threatened flora** is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species. The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline Number 1 and Ministerial Guideline Number 2 that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria[3], and is based on the national distribution of the species.

Conservation Category Definitions for Western Australian Fauna and Flora	
CR	*Critically endangered species* Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as critically endangered undersection 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
EN	*Endangered species* Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.
VU	*Vulnerable species* Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as vulnerable undersection 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct species **Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.**	
EX	*Extinct species* Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
EW	*Extinct in the wild species* Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25of the BC Act). Currently there are no fauna or flora species listed as extinct in the wild.
Specially protected species Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as specially Protected species.	
MI	*Migratory species* Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA)[4], China (CAMBA)[5] and The Republic of Korea (ROKAMBA)[6], and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention)[7], an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
CD	*Species of special conservation interest (conservation dependent)* Species of special conservation need that are dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Currently only fauna are listed as species of special conservation interest.
OS	*Other specially protected species* Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Currently only fauna are listed as species otherwise in need of special protection.

Conservation Category Definitions for Western Australian Fauna and Flora	
P	**Priority species** Priority is not a listing category under the BC Act. All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land). Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened. Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	*Priority 1: Poorly-known species – known from few locations, none on conservation lands* Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.
2	*Priority 2: Poorly-known species – known from few locations, some on conservation lands* Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.
3	*Priority 3: Poorly-known species – known from several locations* Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.
4	*Priority 4: Rare, Near Threatened and other species in need of monitoring* (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. (d) Other species in need of monitoring.

[1] The definition of flora includes algae, fungi and lichens.

[2] Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

[3] Western Australia has assigned species to threat categories using the *IUCN Red List of Threatened Species Categories and Criteria* since 1996 (referencing all criteria).

[4] JAMBA - first included in the WA migratory species list in 1980.

[5] CAMBA - first included in the WA migratory species list in 2010.

[6] ROKAMBA - first included in the WA migratory species list in 2010.

[7] Bonn Convention (Birds) - first included in the WA migratory species list in 2015.

FLORA CRITERIA

Other Significant Flora

According to the Flora and Vegetation Technical Guidance (EPA 2016a) other than being listed as Threatened or Priority Flora, a species can be considered as significant if it is considered to be:

- locally endemic or association with a restricted habitat type (e.g. Groundwater Dependent Ecosystems, Sheet Flow Dependent Vegetation)
- a new species or has anomalous features that indicate a potential new species

- at the extremes of range, recently discovered range extensions (generally considered greater than 100 km or in a different bioregion), or isolated outliers of the main range
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids
- relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

APPENDIX TWO FIELD SURVEY RESULTS

Table 9: Significant flora locations (GDA94, zone 51)

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	16	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	4	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	4	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	1	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	3	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	18	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	3	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	200	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	200	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	100	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	100	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	23/08/2024	424742	7601823

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	50	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	100	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	15	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	20	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	5	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	40	19/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	19/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	20/08/2024	424742	7601823

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	2	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	1	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	20/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	22/08/2024	424742	7601823
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Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	22/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	23/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	19	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	34	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	2	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	8	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	42	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	44	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	45	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	45	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	35	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	6	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	53	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	65	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	55	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	23	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	68	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	81	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	76	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	72	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	38	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	29	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	80	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	60	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	18	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	16	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	37	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	26	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	60	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	60	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	50	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	45	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	60	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	35	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	40	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	60	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	24	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	7	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	30	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	28	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	6	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	1	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	1	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	1	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	25	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	20	21/08/2024	424742	7601823

Species	Cons. Code.	Count	Date	Easting	Northing
Goodenia hartiana	Priority 2	10	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	15	21/08/2024	424742	7601823
Goodenia hartiana	Priority 2	5	21/08/2024	424742	7601823
Seringia exastia	Threatened (EPBC)	30	19/08/2024	424742	7601823
Seringia exastia	Threatened (EPBC)	50	22/08/2024	424742	7601823
Thysanotus sp. Desert East of Newman (R.P. Hart 964)	Priority 2	1	21/08/2024	424742	7601823

APPENDIX THREE DBCA REPORT FORMS

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.4 March 2021

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Goodenia hartiana **TPFL Pop. No:**

OBSERVATION DATE: 19/08/2024 **CONSERVATION STATUS:** P2 **New population** ☒

OBSERVER/S: Stephen Kern **PHONE** (08) 9430 8955

ROLE: Botanist **ORGANISATION:** Ecoscape

EMAIL: stephenk@ecoscape.com.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place)**:**

Approximately 5 km NE of Telfer Camp

Reserve No:

DBCA DISTRICT: Pilbara **LGA:** Shire of East Pilbara Land manager present: ☐

DATUM:

GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)

DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 7601333

Long / Easting: 423950

ZONE: 51

METHOD USED:

GPS ☒ Differential GPS ☐ Map ☐

No. satellites: ____ Map used: _____

Boundary polygon captured: ☐ Map scale: _____

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☐
National park ☐	State forest ☐	Pastoral lease ☒	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole _____ to _____	Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m²): _____

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count method: _____ (Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive	6610 total of all data			
Dead				

Area of pop (m²): _____

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size _____ Data attached ☐ Total area of quadrats (m²): _____

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 50%

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential Impact (L-E)**	**Potential Threat Onset (S-L)**
•			
•			
•			

Please return completed form to **Species And Communities Program** DBCA,

Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.4 March 2021

HABITAT INFORMATION:

LANDFORM:
Crest ☐
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☒
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other:
Nil

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☒
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☒
Sandy loam ☐
Loam ☐
Clay loam ☐
Light clay ☐
Peat ☐
Specify other:

SOIL COLOUR:
Red ☒
Brown ☒
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other:

DRAINAGE:
Well drained ☒
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element:
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1**. Banksia woodland (B. attenuata, B. ilicifolia); **2**. Open shrubland (Hibbertia sp., Acacia spp.) ; **3**. Isolated clumps of sedges (M.tetragona)

1.
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☒ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☒ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

FLORA AUTHORISATION / LICENCE No: FB62000001-2 Note if only observing plants (i.e. no specimens or plant matieral is taken) then no authorisation/licence is required. For further information on authorisation and licening requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

LODGEMENT: WA Herb Lodgement No: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☒ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: _____

Submitter of Record: Stephen Kern Role: Botanist Signed: Stephen Kern Date: 30/09/2024

Please return completed form to **Species And Communities Program** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑

Species	Cons. Code	Count	Easting	Northing	Date
Goodenia hartiana	2	10	423950.061	7601333.5	19/08/2024
Goodenia hartiana	2	10	423940.271	7601369.21	19/08/2024
Goodenia hartiana	2	10	423918.185	7601379.95	19/08/2024
Goodenia hartiana	2	10	423891.519	7601418.12	19/08/2024
Goodenia hartiana	2	10	423842.443	7601383.02	19/08/2024
Goodenia hartiana	2	10	423873.53	7601350.41	19/08/2024
Goodenia hartiana	2	10	423882.224	7601349.45	19/08/2024
Goodenia hartiana	2	10	423888.834	7601330.11	19/08/2024
Goodenia hartiana	2	10	423898.049	7601306.69	19/08/2024
Goodenia hartiana	2	20	423935.226	7601298.68	19/08/2024
Goodenia hartiana	2	10	426116.682	7603732.77	19/08/2024
Goodenia hartiana	2	10	426160.543	7603734.74	19/08/2024
Goodenia hartiana	2	20	426242.042	7603809.61	19/08/2024
Goodenia hartiana	2	20	426285.502	7603831.29	19/08/2024
Goodenia hartiana	2	20	426290.461	7603832.86	19/08/2024
Goodenia hartiana	2	30	426316.276	7603844.27	19/08/2024
Goodenia hartiana	2	16	426368.541	7603863.77	19/08/2024
Goodenia hartiana	2	5	426382.042	7603875.56	19/08/2024
Goodenia hartiana	2	40	426397.565	7603897.44	19/08/2024
Goodenia hartiana	2	4	426457.333	7603950.51	19/08/2024
Goodenia hartiana	2	30	426478.095	7603958.25	19/08/2024
Goodenia hartiana	2	20	426596.032	7604097.92	19/08/2024
Goodenia hartiana	2	20	426623.114	7604103.8	19/08/2024
Goodenia hartiana	2	20	426628.81	7604102.61	19/08/2024
Goodenia hartiana	2	20	426655.606	7604103.29	19/08/2024
Goodenia hartiana	2	20	426658.916	7604103.52	19/08/2024
Goodenia hartiana	2	20	426663.981	7604104.54	19/08/2024
Goodenia hartiana	2	4	426706.649	7604118.79	19/08/2024
Goodenia hartiana	2	20	426711.084	7604121.8	19/08/2024
Goodenia hartiana	2	20	426738.774	7604130.67	19/08/2024
Goodenia hartiana	2	30	426768.307	7604143.65	19/08/2024
Goodenia hartiana	2	30	426779.964	7604151.45	19/08/2024
Goodenia hartiana	2	20	426796.168	7604183.07	19/08/2024
Goodenia hartiana	2	2	426806.158	7604215.88	19/08/2024
Goodenia hartiana	2	10	426821.79	7604236.76	19/08/2024
Goodenia hartiana	2	1	427041.797	7604458.26	19/08/2024
Goodenia hartiana	2	10	427049.027	7604461.06	19/08/2024
Goodenia hartiana	2	25	427145.176	7604433.16	19/08/2024
Goodenia hartiana	2	25	427141.885	7604428.71	19/08/2024
Goodenia hartiana	2	25	426938.158	7604222.02	19/08/2024
Goodenia hartiana	2	25	426931.855	7604220.11	19/08/2024
Goodenia hartiana	2	20	426913.738	7604199.55	19/08/2024
Goodenia hartiana	2	20	426889.1	7604179.4	19/08/2024
Goodenia hartiana	2	20	426876.576	7604157.76	19/08/2024
Goodenia hartiana	2	20	426861.512	7604125.59	19/08/2024
Goodenia hartiana	2	20	426829.032	7604100.87	19/08/2024
Goodenia hartiana	2	20	426821.872	7604082.68	19/08/2024
Goodenia hartiana	2	20	426786.136	7604045.88	19/08/2024
Goodenia hartiana	2	10	426763.668	7604026.41	19/08/2024
Goodenia hartiana	2	10	426718.442	7604005.94	19/08/2024
Goodenia hartiana	2	10	426571.937	7603913.85	19/08/2024
Goodenia hartiana	2	30	426415.711	7603730.82	19/08/2024
Goodenia hartiana	2	30	426396.648	7603736.27	19/08/2024
Goodenia hartiana	2	30	426393.713	7603744.56	19/08/2024
Goodenia hartiana	2	30	426352.934	7603769.94	19/08/2024
Goodenia hartiana	2	20	426347.654	7603770.58	19/08/2024
Goodenia hartiana	2	20	426321.331	7603779.76	19/08/2024
Goodenia hartiana	2	30	426316.244	7603783.61	19/08/2024
Goodenia hartiana	2	30	426289.286	7603795.77	19/08/2024
Goodenia hartiana	2	2	428698.631	7606499.62	20/08/2024
Goodenia hartiana	2	2	428629.483	7606410.98	20/08/2024
Goodenia hartiana	2	20	428628.308	7606395.92	20/08/2024

Species	Cons. Code	Count	Easting	Northing	Date
Goodenia hartiana	2	5	428596.377	7606385.71	20/08/2024
Goodenia hartiana	2	5	428565.709	7606393.98	20/08/2024
Goodenia hartiana	2	10	428540.317	7606379.26	20/08/2024
Goodenia hartiana	2	20	428533.596	7606354.77	20/08/2024
Goodenia hartiana	2	20	428567.454	7606350.6	20/08/2024
Goodenia hartiana	2	20	428582.513	7606338.49	20/08/2024
Goodenia hartiana	2	20	428597.114	7606336.23	20/08/2024
Goodenia hartiana	2	20	428622.912	7606329.37	20/08/2024
Goodenia hartiana	2	20	428634.726	7606325.55	20/08/2024
Goodenia hartiana	2	20	428646.387	7606356.26	20/08/2024
Goodenia hartiana	2	2	428651.333	7606360.93	20/08/2024
Goodenia hartiana	2	5	428640.18	7606402.39	20/08/2024
Goodenia hartiana	2	10	428691.377	7606455.2	20/08/2024
Goodenia hartiana	2	10	428693.547	7606455.87	20/08/2024
Goodenia hartiana	2	20	461444.91	7597863.93	21/08/2024
Goodenia hartiana	2	30	461706.259	7597821.17	21/08/2024
Goodenia hartiana	2	30	461469.956	7597856.57	21/08/2024
Goodenia hartiana	2	30	461472.424	7597862.78	21/08/2024
Goodenia hartiana	2	30	461452.755	7597870.37	21/08/2024
Goodenia hartiana	2	3	461431.346	7597870.32	21/08/2024
Goodenia hartiana	2	18	461271.528	7597882.66	21/08/2024
Goodenia hartiana	2	15	461002.293	7597977.86	21/08/2024
Goodenia hartiana	2	15	460975.278	7597986.87	21/08/2024
Goodenia hartiana	2	15	460919.186	7598001.56	21/08/2024
Goodenia hartiana	2	50	460905.217	7598004.3	21/08/2024
Goodenia hartiana	2	30	460828.634	7598024.7	21/08/2024
Goodenia hartiana	2	30	460830.69	7598029.9	21/08/2024
Goodenia hartiana	2	30	460732.775	7598060.55	21/08/2024
Goodenia hartiana	2	30	460678.234	7598075.47	21/08/2024
Goodenia hartiana	2	30	460738.485	7598051.93	21/08/2024
Goodenia hartiana	2	30	460809.996	7597991.45	21/08/2024
Goodenia hartiana	2	30	460840.43	7597979.9	21/08/2024
Goodenia hartiana	2	30	460849.148	7597967.52	21/08/2024
Goodenia hartiana	2	3	460868.436	7597946.65	21/08/2024
Goodenia hartiana	2	10	460979.285	7597912.61	21/08/2024
Goodenia hartiana	2	10	461129.265	7597863.39	21/08/2024
Goodenia hartiana	2	20	460550.416	7597440.26	22/08/2024
Goodenia hartiana	2	2	460573.111	7597505.62	22/08/2024
Goodenia hartiana	2	10	460579.065	7597523.57	22/08/2024
Goodenia hartiana	2	10	460643.718	7597811.84	22/08/2024
Goodenia hartiana	2	10	460655.35	7597834.01	22/08/2024
Goodenia hartiana	2	5	460828.941	7597772.23	22/08/2024
Goodenia hartiana	2	5	461075.208	7597807.47	22/08/2024
Goodenia hartiana	2	5	461099.052	7597783.73	22/08/2024
Goodenia hartiana	2	5	461126.81	7597767.2	22/08/2024
Goodenia hartiana	2	200	415407.664	7614406.21	23/08/2024
Goodenia hartiana	2	200	415101.297	7614366.08	23/08/2024
Goodenia hartiana	2	20	415097.566	7614366.72	23/08/2024
Goodenia hartiana	2	50	415133.905	7614367.36	23/08/2024
Goodenia hartiana	2	100	414980.374	7614364.23	23/08/2024
Goodenia hartiana	2	100	414820.252	7614354.3	23/08/2024
Goodenia hartiana	2	5	414115.149	7613732.68	23/08/2024
Goodenia hartiana	2	50	415028.291	7610872.26	23/08/2024
Goodenia hartiana	2	50	415016.588	7610539.79	23/08/2024
Goodenia hartiana	2	5	425166.217	7602714.67	23/08/2024
Goodenia hartiana	2	5	425131.363	7602667.79	23/08/2024
Goodenia hartiana	2	5	424731.483	7602029.12	23/08/2024
Goodenia hartiana	2	5	424710.96	7601993.27	23/08/2024
Goodenia hartiana	2	30	424569.805	7601759.71	23/08/2024
Goodenia hartiana	2	30	424521.007	7601708.9	23/08/2024
Goodenia hartiana	2	20	424421.318	7601634.26	23/08/2024
Goodenia hartiana	2	20	423875.418	7601279.46	23/08/2024

Species	Cons. Code	Count	Easting	Northing	Date
Goodenia hartiana	2	5	414327.843	7600750.67	19/08/2024
Goodenia hartiana	2	10	415029.166	7610843.71	19/08/2024
Goodenia hartiana	2	100	415110.141	7610819.34	19/08/2024
Goodenia hartiana	2	10	426969.347	7603166.18	19/08/2024
Goodenia hartiana	2	20	426953.205	7603166.55	19/08/2024
Goodenia hartiana	2	5	425627.46	7603314.54	19/08/2024
Goodenia hartiana	2	5	425233.97	7602806.52	19/08/2024
Goodenia hartiana	2	20	425275.888	7602825.31	19/08/2024
Goodenia hartiana	2	10	425205.931	7602851.22	19/08/2024
Goodenia hartiana	2	10	425114.136	7602634.73	19/08/2024
Goodenia hartiana	2	10	424706.482	7601977.42	19/08/2024
Goodenia hartiana	2	20	424506.276	7601695.54	19/08/2024
Goodenia hartiana	2	20	423953.578	7601333.63	19/08/2024
Goodenia hartiana	2	20	423946.918	7601319.98	19/08/2024
Goodenia hartiana	2	10	423953.433	7601320.68	19/08/2024
Goodenia hartiana	2	20	423932.41	7601303.53	19/08/2024
Goodenia hartiana	2	20	423945.1	7601288.87	19/08/2024
Goodenia hartiana	2	20	423945.843	7601284.89	19/08/2024
Goodenia hartiana	2	20	423953.76	7601273.53	19/08/2024
Goodenia hartiana	2	10	423964.543	7601268.37	19/08/2024
Goodenia hartiana	2	10	423971.824	7601238.19	19/08/2024
Goodenia hartiana	2	20	423973.018	7601226.57	19/08/2024
Goodenia hartiana	2	10	423980.962	7601209.34	19/08/2024
Goodenia hartiana	2	30	424011.764	7601214.91	19/08/2024
Goodenia hartiana	2	20	424055.405	7601218.22	19/08/2024
Goodenia hartiana	2	20	424075.517	7601252.96	19/08/2024
Goodenia hartiana	2	20	424100.699	7601265.7	19/08/2024
Goodenia hartiana	2	20	424104.366	7601277.78	19/08/2024
Goodenia hartiana	2	15	426099.764	7603744.32	19/08/2024
Goodenia hartiana	2	10	426213.498	7603829.3	19/08/2024
Goodenia hartiana	2	20	426223.309	7603833.1	19/08/2024
Goodenia hartiana	2	20	426237.538	7603844.02	19/08/2024
Goodenia hartiana	2	5	426268.444	7603850.69	19/08/2024
Goodenia hartiana	2	5	426310.716	7603860.85	19/08/2024
Goodenia hartiana	2	20	426402.267	7603955.13	19/08/2024
Goodenia hartiana	2	10	426571	7604096.26	19/08/2024
Goodenia hartiana	2	10	426627.545	7604107.81	19/08/2024
Goodenia hartiana	2	20	426640.852	7604116.61	19/08/2024
Goodenia hartiana	2	30	426684.453	7604130.43	19/08/2024
Goodenia hartiana	2	15	426716.629	7604153.93	19/08/2024
Goodenia hartiana	2	25	426733.478	7604180.24	19/08/2024
Goodenia hartiana	2	25	426699.826	7604230.78	19/08/2024
Goodenia hartiana	2	40	426641.08	7604202.73	19/08/2024
Goodenia hartiana	2	10	426600.734	7604155.84	19/08/2024
Goodenia hartiana	2	10	426570.369	7604143.63	19/08/2024
Goodenia hartiana	2	10	426236.115	7603905.89	19/08/2024
Goodenia hartiana	2	30	426227.06	7603895.11	19/08/2024
Goodenia hartiana	2	30	426181.366	7603864.02	19/08/2024
Goodenia hartiana	2	5	428530.326	7606415.3	20/08/2024
Goodenia hartiana	2	10	428502.076	7606391.71	20/08/2024
Goodenia hartiana	2	2	428472.445	7606376.19	20/08/2024
Goodenia hartiana	2	1	427714.171	7605903.69	20/08/2024
Goodenia hartiana	2	30	427714.277	7605903.14	20/08/2024
Goodenia hartiana	2	20	460571.537	7597430.8	22/08/2024
Goodenia hartiana	2	10	460582.273	7597438.79	22/08/2024
Goodenia hartiana	2	5	460600.58	7597438.17	22/08/2024
Goodenia hartiana	2	10	460600.034	7597449.79	22/08/2024
Goodenia hartiana	2	10	460600.137	7597449.9	22/08/2024
Goodenia hartiana	2	2	460620.57	7597467.89	22/08/2024
Goodenia hartiana	2	2	460617.577	7597465.55	22/08/2024
Goodenia hartiana	2	2	460645.668	7597481.23	22/08/2024
Goodenia hartiana	2	2	460638.965	7597473.69	22/08/2024

Species	Cons. Code	Count	Easting	Northing	Date
Goodenia hartiana	2	20	460652.177	7597483.9	22/08/2024
Goodenia hartiana	2	20	460668.799	7597495.57	22/08/2024
Goodenia hartiana	2	10	460672.294	7597504.54	22/08/2024
Goodenia hartiana	2	10	460692.202	7597525.84	22/08/2024
Goodenia hartiana	2	10	425182.803	7602774.29	23/08/2024
Goodenia hartiana	2	15	426954	7603133	20/08/2024
Goodenia hartiana	2	19	426946	7603125	20/08/2024
Goodenia hartiana	2	34	426924	7603098	20/08/2024
Goodenia hartiana	2	2	426915	7603084	20/08/2024
Goodenia hartiana	2	8	426914	7603067	20/08/2024
Goodenia hartiana	2	42	426907	7603045	20/08/2024
Goodenia hartiana	2	44	426886	7603009	20/08/2024
Goodenia hartiana	2	30	426889	7602981	20/08/2024
Goodenia hartiana	2	45	426898	7602945	20/08/2024
Goodenia hartiana	2	45	426917	7602946	20/08/2024
Goodenia hartiana	2	35	426944	7602974	20/08/2024
Goodenia hartiana	2	30	427028	7603005	20/08/2024
Goodenia hartiana	2	6	427070	7603069	20/08/2024
Goodenia hartiana	2	53	427113	7603045	20/08/2024
Goodenia hartiana	2	10	427135	7603024	20/08/2024
Goodenia hartiana	2	65	427140	7603016	20/08/2024
Goodenia hartiana	2	30	427157	7602988	20/08/2024
Goodenia hartiana	2	55	427130	7602955	20/08/2024
Goodenia hartiana	2	23	427111	7602928	20/08/2024
Goodenia hartiana	2	68	427085	7602897	20/08/2024
Goodenia hartiana	2	81	427063	7602867	20/08/2024
Goodenia hartiana	2	76	427061	7602835	20/08/2024
Goodenia hartiana	2	72	427044	7602814	20/08/2024
Goodenia hartiana	2	38	427023	7602789	20/08/2024
Goodenia hartiana	2	29	426988	7602718	20/08/2024
Goodenia hartiana	2	50	426981	7602705	20/08/2024
Goodenia hartiana	2	80	426967	7602675	20/08/2024
Goodenia hartiana	2	50	426956	7602665	20/08/2024
Goodenia hartiana	2	60	426935	7602629	20/08/2024
Goodenia hartiana	2	40	426916	7602597	20/08/2024
Goodenia hartiana	2	40	426912	7602579	20/08/2024
Goodenia hartiana	2	18	427116	7602778	20/08/2024
Goodenia hartiana	2	25	427129	7602849	20/08/2024
Goodenia hartiana	2	10	427143	7602871	20/08/2024
Goodenia hartiana	2	16	427166	7602895	20/08/2024
Goodenia hartiana	2	20	427199	7602944	20/08/2024
Goodenia hartiana	2	10	427370	7603096	20/08/2024
Goodenia hartiana	2	25	425295	7602810	20/08/2024
Goodenia hartiana	2	15	425323	7602798	20/08/2024
Goodenia hartiana	2	25	425361	7602794	20/08/2024
Goodenia hartiana	2	15	425395	7602784	20/08/2024
Goodenia hartiana	2	15	425432	7602774	20/08/2024
Goodenia hartiana	2	25	425530	7602777	20/08/2024
Goodenia hartiana	2	20	425551	7602789	20/08/2024
Goodenia hartiana	2	40	425564	7602790	20/08/2024
Goodenia hartiana	2	50	425572	7602779	20/08/2024
Goodenia hartiana	2	37	425579	7602769	20/08/2024
Goodenia hartiana	2	26	425583	7602755	20/08/2024
Goodenia hartiana	2	40	425658	7602737	20/08/2024
Goodenia hartiana	2	60	425647	7602705	20/08/2024
Goodenia hartiana	2	50	425682	7602673	20/08/2024
Goodenia hartiana	2	60	425702	7602670	20/08/2024
Goodenia hartiana	2	50	425712	7602660	20/08/2024
Goodenia hartiana	2	45	425776	7602636	20/08/2024
Goodenia hartiana	2	60	425776	7602614	20/08/2024
Goodenia hartiana	2	35	425831	7602573	20/08/2024
Goodenia hartiana	2	10	425672	7602530	20/08/2024

Species	Cons. Code	Count	Easting	Northing	Date
Goodenia hartiana	2	40	425599	7602556	20/08/2024
Goodenia hartiana	2	60	425531	7602597	20/08/2024
Goodenia hartiana	2	30	425483	7602612	20/08/2024
Goodenia hartiana	2	24	425234	7602731	20/08/2024
Goodenia hartiana	2	15	425157	7602793	20/08/2024
Goodenia hartiana	2	25	425073	7602903	20/08/2024
Goodenia hartiana	2	25	425151	7602874	20/08/2024
Goodenia hartiana	2	7	425204	7602849	20/08/2024
Goodenia hartiana	2	5	424703	7601949	20/08/2024
Goodenia hartiana	2	10	424706	7601948	20/08/2024
Goodenia hartiana	2	15	424739	7601944	20/08/2024
Goodenia hartiana	2	30	424837	7601880	20/08/2024
Goodenia hartiana	2	10	424864	7601822	20/08/2024
Goodenia hartiana	2	15	424766	7601796	20/08/2024
Goodenia hartiana	2	10	424644	7601994	20/08/2024
Goodenia hartiana	2	10	424618	7602018	20/08/2024
Goodenia hartiana	2	10	424454	7602116	20/08/2024
Goodenia hartiana	2	28	424309	7602160	20/08/2024
Goodenia hartiana	2	5	424296	7602162	20/08/2024
Goodenia hartiana	2	15	424246	7602202	20/08/2024
Goodenia hartiana	2	6	424213	7602213	20/08/2024
Goodenia hartiana	2	20	424175	7602218	20/08/2024
Goodenia hartiana	2	20	424146	7602255	20/08/2024
Goodenia hartiana	2	10	424234	7602089	20/08/2024
Goodenia hartiana	2	5	425222	7602732	20/08/2024
Goodenia hartiana	2	1	425220	7602730	20/08/2024
Goodenia hartiana	2	1	425220	7602730	20/08/2024
Goodenia hartiana	2	1	425220	7602730	20/08/2024
Goodenia hartiana	2	20	425215	7602726	20/08/2024
Goodenia hartiana	2	10	425215	7602726	20/08/2024
Goodenia hartiana	2	15	425149	7602774	20/08/2024
Goodenia hartiana	2	15	425135	7602779	20/08/2024
Goodenia hartiana	2	10	424847	7601869	20/08/2024
Goodenia hartiana	2	15	424885	7601840	20/08/2024
Goodenia hartiana	2	5	424963	7601802	20/08/2024
Goodenia hartiana	2	25	425252	7601428	20/08/2024
Goodenia hartiana	2	20	425237	7601425	20/08/2024
Goodenia hartiana	2	10	425213	7601452	20/08/2024
Goodenia hartiana	2	10	425179	7601482	20/08/2024
Goodenia hartiana	2	10	425146	7601506	20/08/2024
Goodenia hartiana	2	10	425069	7601572	20/08/2024
Goodenia hartiana	2	20	424990	7601622	20/08/2024
Goodenia hartiana	2	10	424936	7601662	20/08/2024
Goodenia hartiana	2	20	424886	7601679	20/08/2024
Goodenia hartiana	2	10	424791	7601798	20/08/2024
Goodenia hartiana	2	15	424767	7601808	20/08/2024
Goodenia hartiana	2	5	424741	7601821	20/08/2024

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.4 March 2021

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Thysanotus sp. Desert East of Newman (R.P. Hart 964) **TPFL Pop. No:**

OBSERVATION DATE: 21/08/2024 **CONSERVATION STATUS:** P2 **New population** ☒

OBSERVER/S: Stephen Kern **PHONE** (08) 9430 8955

ROLE: Botanist **ORGANISATION:** Ecoscape

EMAIL: stephenk@ecoscape.com.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place)**:**

Havieron Mine Area, approximately 40 km E of Telfer Camp

Reserve No:

DBCA DISTRICT: Pilbara **LGA:** Shire of East Pilbara Land manager present: ☐

DATUM:
GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)
DecDegrees ☐ DegMinSec ☐ UTMs ☒
Lat / Northing: 7597973
Long / Easting: 460832
ZONE: 51

METHOD USED:
GPS ☒ Differential GPS ☐ Map ☐
No. satellites: ___ Map used: _____
Boundary polygon captured: ☐ Map scale: _____

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☐
National park ☐	State forest ☐	Pastoral lease ☒	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole _____ to _____	Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m²): _____

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count method: _____
(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive	1			
Dead				

Area of pop (m²): _____

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size _____ Data attached ☐ Total area of quadrats (m²): _____

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒
Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 100%

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential Impact (L-E)**	**Potential Threat Onset (S-L)**
•			
•			
•			

Please return completed form to **Species And Communities Program** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.4 March 2021

HABITAT INFORMATION:

LANDFORM:
Crest ☐
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☒
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other: Nil

LOOSE ROCK: (on soil surface; eg gravel, quartz fields)
0-10% ☒
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☒
Sandy loam ☐
Loam ☐
Clay loam ☐
Light clay ☐
Peat ☐
Specify other: _____

SOIL COLOUR:
Red ☒
Brown ☒
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other: _____

DRAINAGE:
Well drained ☒
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element: _____
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1**. Banksia woodland (B. attenuata, B. ilicifolia); **2**. Open shrubland (Hibbertia sp., Acacia spp.) ; **3**. Isolated clumps of sedges (M.tetragona)

1.
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☒ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☒ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

FLORA AUTHORISATION / LICENCE No: FB62000001-2 Note if only observing plants (i.e. no specimens or plant matieral is taken) then no authorisation/licence is required. For further information on authorisation and licening requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

LODGEMENT: WA Herb Lodgement No: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: _____

Submitter of Record: Stephen Kern Role: Botanist Signed:  Date: 30/09/2024

Please return completed form to **Species And Communities Program** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑