Biota Environmental Sciences

Mt Goldsworthy South Detailed Flora and Vegetation Survey

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1.0 Executive Summary

BHP Western Australia Iron Ore commissioned Biota Environmental Sciences to complete a desktop study and a single-season detailed and targeted flora and vegetation survey of the Mt Goldsworthy South Survey Area (951.7 hectares) in the Pilbara region of Western Australia. The aim of the study was to identify key biological values within the Survey Area, particularly communities or species listed as Threatened under the Commonwealth *Environment Protection and Biodiversity Act 1999* or the WA *Biodiversity Conservation Act 2016*, or listed as Priority by the WA Department of Biodiversity, Conservation and Attractions.

The field survey was undertaken between March 24th and 29th in 2025. The survey was conducted during the recommended post-wet season survey timing for the Pilbara and following above-average rainfall prior to the survey, resulting in optimal on-ground conditions.

Approximately 0.4% of the Survey Area was cleared, consisting of minor tracks, and a further 0.1% comprised rehabilitated vegetation on a previously cleared mine slope. Five intact vegetation associations were mapped for the remainder of the Survey Area: two from sandy and stony plains, one from gilgai plains, and two from a medium-sized drainage line and its associated floodplain. None of the vegetation associations comprised listed Threatened Ecological Communities or Priority Ecological Communities. Four of the five vegetation associations present in the Survey Area supported Priority flora (see below); no locations were recorded within the remaining gilgai plain unit.

Most of the Survey Area (97.6%) was rated as being in 'Very Good' condition due to the presence of scattered weeds and signs of cattle, however a number of sections were considered to be 'Excellent', with no signs of disturbance. The tracks and rehabilitated mine slope were rated as 'Completely Degraded'. Disturbance was typically due to weed invasion, impacts from cattle, and/or previous clearing or ground disturbance.

A total of 238 native vascular flora taxa from 105 genera and 42 families were recorded during the survey, and three additional native species were recorded by previous sampling in the Survey Area. Seven introduced flora species were recorded, including **Calotropis procera* (Calotrope), which is a Declared Pest for the whole of WA under the *Biosecurity and Agriculture Management Act 2007*. Calotrope was recorded from one location, along the north-south track in the eastern section of the Survey Area.

No Threatened flora were recorded from the Survey Area, and none would occur based on the location of the Survey Area and the habitats present. Five Priority 3 flora species were recorded during the field survey:

- *Bonamia oblongifolia*
- *Euphorbia clementii*
- *Euphorbia inappendiculata* var. *inappendiculata*
- *Euphorbia inappendiculata* var. *queenslandica*
- *Uvedalia clementii*.

Two unresolved taxa could potentially represent additional Priority species from the Survey Area: *Josephinia* sp. indet. (potentially the Priority 1 *Josephinia* sp. Woodstock (A.A. Mitchell PRP 989)) and *Tribulopis* sp. indet. (potentially the Priority 3 *Tribulopis marliesiae*). While neither taxa is considered particularly likely to represent the Priority species, based on their current known distribution; the material was too poor to confirm these specimens to species

level. The remaining Priority flora species returned from the desktop study were ranked as having a low likelihood of occurrence in the Survey Area following the field survey.

2.0 Introduction

2.1 Project Background

BHP Western Australia Iron Ore (BHP WAIO) commissioned Biota Environmental Sciences (Biota) to conduct a single-season detailed flora and vegetation survey and targeted flora searches of the Mt Goldsworthy South project area (hereafter referred to as the 'Survey Area'). The Survey Area covers 951.7 hectares (ha) and is situated 96 kilometres (km) east of Port Hedland, near the Yarrie mining complex in the Pilbara region of Western Australia (Figure 2.1).

The Survey Area consists of oe-tenure areas and is adjacent to the relict Mt Goldsworthy mining operational site. This survey was not intended to assess any specific work proposed by BHP WAIO; rather, the flora and vegetation assessment will be used to inform future environmental impact assessments across the area.

2.2 Study Scope

The scope of work required by BHP WAIO comprised a single-phase detailed flora and vegetation survey in accordance with the Environmental Protection Authority (EPA) technical guidance (EPA 2016a). This required an optimally-timed field survey, including a combination of mapping and floristic sampling of vegetation types using replicated quadrats (or relevés as appropriate), mapping of vegetation condition, and targeted and opportunistic searches for significant flora species. Reference data from previous surveys were also consolidated through a desktop study to inform the current survey, with a particular focus on identifying significant species and communities with the potential to occur in the Survey Area. This analysis applied a 40 km bueer around the Survey Area (hereafter the 'Study Area') (see Figure 2.1).

Survey data arising from the flora and vegetation sampling were also required in the EPA's Index of Biodiversity Surveys for Assessments (IBSA) format, and have been digitally supplied under separate cover with this report.

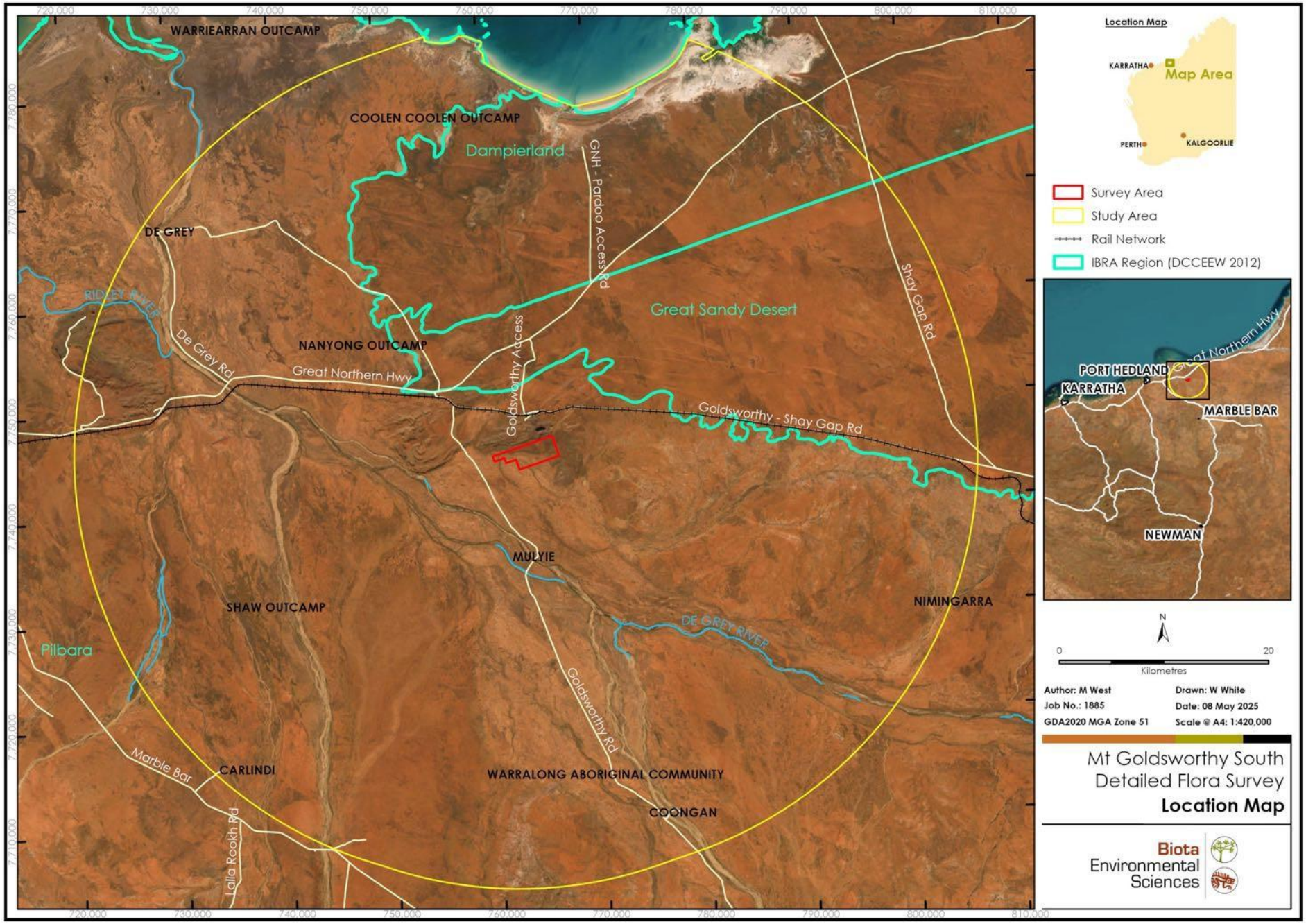

Figure 2.1: Location of the Mt Goldsworthy South Survey Area.

3.0 Methods

3.1 Policy Framework

Our approach and methodology were prepared with reference to relevant policy documents and technical guidelines including, but not limited to:

- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a);
- *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b); and
- BHP's *Vegetation and Flora Survey Procedure* (no. 0124627, Version 3.0; BHP undated).

3.2 Desktop Study

The desktop study was conducted within a 40 km bueer of the Survey Area (i.e. the Study Area) to identify key biological features. The desktop study incorporated regional information, previous biological surveys in the Study Area, and the results of database searches (see Appendix 1). The desktop study formed the basis for compiling lists of flora species and ecological communities of significance with the potential to occur within the Survey Area, and for assessing their likelihood of occurrence (see Appendix 2 for definitions of significant species and communities).

3.2.1 Database Searches

The following databases were searched to identify flora and communities of significance that had previously been recorded from the Study Area:

- The Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Protected Matters Search Tool (PMST) was searched to identify significant communities and species listed under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) that may occur in the Study Area (Appendix 1).
- The databases of the WA Herbarium and the Department of Biodiversity, Conservation and Attraction's (DBCA) Species and Communities Branch were searched for records of Threatened and Priority flora, and for Threatened and Priority Ecological Communities (TECs and PECs) known to occur in the Study Area.
- The NatureMap database was a joint project of the DBCA and the WA Museum, which was taken oeline in 2021. As the database is no longer accessible online, a manual database search for records of all flora species was completed for Biota by DBCA stae. The database search results pertaining to significant species are summarised in Appendix 1.
- The Atlas of Living Australia (ALA) database was searched for significant flora records. This database is hosted by the Commonwealth Scientific and Industrial Research Organisation.
- The Department of Water and Environmental Regulation's (DWER) IBSA database was searched for previous botanical surveys conducted within the Study Area.
- Biota's internal flora database.

3.2.2 Literature and Spatial Data Review

Publicly available literature was searched for relevant flora and vegetation surveys conducted in or around the Survey Area. Reports from key studies were reviewed (see Section 4.8). The

results were used to inform the likelihood assessments of significant communities and species potentially occurring in the Survey Area, and to identify potential habitats for targeted survey eeort.

Literature and spatial layers relating to existing biogeographical information, including soils, geology, land systems mapping, surface water values, conservation estate, Environmentally Sensitive Areas (ESAs), and broad pre-European vegetation mapping, were also reviewed and collated for this study.

3.3 Assessment of Likelihood of Occurrence

For the purposes of this report, the term 'significant' has been applied to species and communities that have been formally assigned a conservation ranking under the EPBC Act or BC Act (i.e. Threatened species or TECs), or under the DBCA lists of Priority species and PECs. These rankings typically recognise rare, unusual, new, or poorly sampled species and communities (see Appendix 2).

For previously recorded significant communities and flora species identified in the desktop study, the likelihood of occurrence within the Survey Area was assessed prior to the field survey and reviewed following its completion. The likelihood assessment was based on factors including the proximity of previous records to the Survey Area, knowledge of the associated landforms (for communities) or habitat preferences (for species), an assessment of the habitats present within the Survey Area made during the field survey, and any records obtained during the field survey.

A guide to ranking the likelihood of occurrence for species is outlined in Table 3.1, and was adapted to assess communities. For the purposes of this report, the term "proximity" is defined as within 20 km of the Survey Area, while "locality" is the Study Area. The likelihood rankings for species are summarised in Appendix 3.

Table 3.1: Likelihood ranking guide for species that may occur in the Survey Area.

Rank / Likelihood	Criteria
Recorded	1. The species has been recorded in the Survey Area.
Likely to occur / High	1. There are existing records of the species in proximity to the Survey Area; and • the species is strongly linked to a specific habitat, which is present in the Survey Area; or • the species has more general habitat preferences, and suitable habitat is present.
May occur / Moderate	1. There are existing records of the species from the locality, however • the species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area; or • the species has more general habitat preferences, but only some suitable habitat is present. 2. There is suitable habitat in the Survey Area, but the species is recorded infrequently in the locality.
Unlikely to occur / Low	1. The species is linked to a specific habitat, which is absent from the Survey Area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search eUort in suitable habitat; or 3. There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality or the only records are historical (>40 years old).
Would not occur / Negligible	1. The species is strongly linked to a specific habitat, which is absent from the Survey Area; or

Rank / Likelihood	Criteria
	2. The species' range is very restricted and does not include the Survey Area; or 3. The species is not considered extant in the locality.

3.4 Survey Timing and Personnel

The flora and vegetation survey was completed over a six-day period from March 24th to 29th 2025. A summary of the survey team, their roles in the survey and experience is shown in Table 3.2.

Table 3.2: Survey team, qualifications and experience.

Name	Position	Survey Role	Qualification	Years of Experience	DBCA Licence
Rachel Warner	Principal Environmental Scientist / General Manager	Team leader	BSc (Hons)	19	FB62000036-3
Jason Teuber	Botanist	Team member	BSc	5	FB62000286-2
Luisa Ducki	Botanist	Team member	BSc (Hons)	4	FB62000394-4
Madeline West	Early-career Botanist	Team member	BSc	1	FB62000729

3.5 Weather and Climate

Conditions in the months leading up to a survey, particularly rainfall, may influence productivity and thereby the overall abundance of individuals for flora species. The amount of rainfall preceding a botanical survey has a direct relationship with flora, influencing the number and type of species recorded and the condition of flora and vegetation. One of the more notable eeects is the increased presence of annual flora species following high rainfall, in addition to a higher likelihood of plants bearing reproductive material (flowers and/or fruit).

Daily weather observations were sourced from the Port Hedland Airport weather station (#004032), located 90 km west of the Survey Area (Figure 3.1). Conditions during the field survey were optimal, with a high number of annual species present. Rainfall in the preceding three months totalled 388.8 millimetres (mm), which was considerably higher than the long-term average of 113.6 mm (Figure 3.1) (Bureau of Meteorology 2025). This was largely the result of heavy rainfall associated with Tropical Cyclone Zelia in mid-February, with 263.0 mm recorded between the 12th and 16th of February 2025.

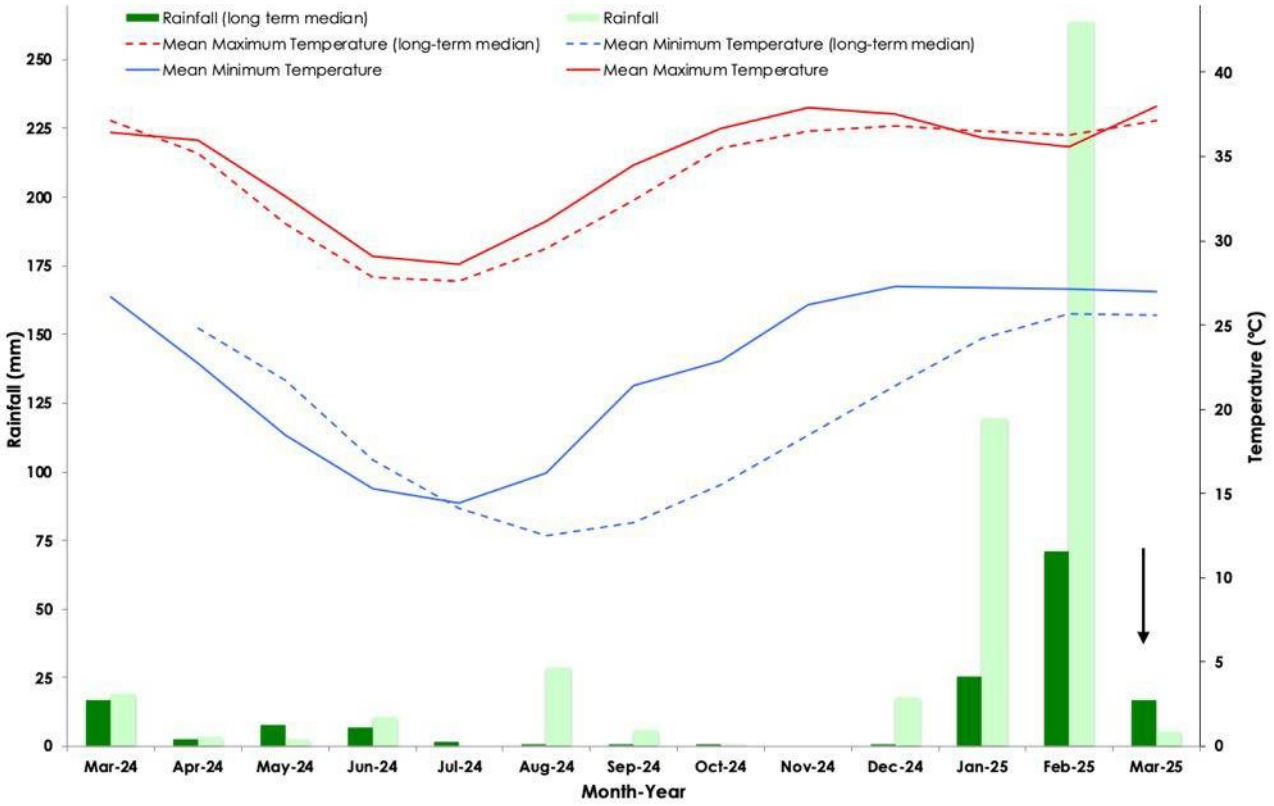

Figure 3.1: **Climate graph depicting long-term medians and 2024-2025 monthly data for the Port Hedland airport weather station (#004032).**
Data from Bureau of Meteorology. Long-term data 1948-2025. Black arrow indicates survey timing (Bureau of Meteorology 2025).

3.6 Detailed Flora and Vegetation Survey

3.6.1 Floristic Sampling

Indicative sample sites were selected prior to the field survey, based on the broad habitats and vegetation types apparent from aerial imagery. Once in the field, the actual locations of sites were adjusted as necessary (e.g. to be placed in an area more representative of the broader vegetation type; or to avoid burnt areas, where this was possible).

Sampling sites were established as quadrats wherever possible. Quadrats were not permanently marked at each corner at the request of BHP, due to ground disturbance restrictions. Relevés were established in vegetation associations that were spatially restricted, or where it was dieicult to set up a quadrat. The quadrats and relevés established during the survey were thoroughly surveyed for flora.

The following parameters were recorded for all quadrats and relevés:

1. Location coordinates[1] (±2 m) were recorded using a hand-held Global Positioning System (GPS) unit at each quadrat corner.
2. Habitat: A description of the landform and habitat.
3. Soil: A broad description of the soil and any stony surface mantle.
4. Fire History: An estimate of time since last fire.

[1] All coordinates presented in this report are in GDA2020 datum and MGA50 projection.

5. Disturbance Details: Vegetation condition was ranked in accordance with BHP WAIO's *Vegetation and Flora Survey Procedure* (no. 0124627, Version 3.0; BHP undated); this considers evidence of grazing, physical disturbance, weed invasion etc (see Appendix 4).
6. Vegetation Description: A broad description based on the height and estimated cover of dominant species and following the framework provided in Appendix 5, as per the requirements defined within (no. 0124627, Version 3.0; BHP undated).
7. Flora Species: The estimated height and percentage of foliar cover of each flora species present in the quadrat or relevé.
8. Photograph: A digital photograph of the vegetation was taken from the northern or northwestern corner.

A total of 28 quadrats and two relevés were established in the Survey Area (see Figure 3.2 for survey eeort and site locations). Aside from one spatially restricted unit with insueicient area, a minimum of three sampling sites were established within each vegetation type, consistent with EPA (2016a) requirements for a detailed flora and vegetation survey. Raw data for all sites are provided in Appendix 6.

3.6.2 Vegetation Description and Mapping

The scale of vegetation mapping is influenced by a range of factors including spatial characteristics of the Survey Area (e.g. the size and variety of habitats present), and other factors such as the scope of the survey and the availability of current, high-resolution aerial photography. The vegetation types for this survey were described at the association level (level V as per the National Vegetation Information System; NVIS)[2]. This level of detail would be considered fine-scale (intra-locality) delineation of vegetation types as per EPA (2016a). In general, minor variations in the vegetation that were not clearly defined on aerial imagery, did not exhibit strong dieerentiation from surrounding vegetation, or were impractical to accurately map in the field (e.g. along minor flowlines), were incorporated into the surrounding 'parent' vegetation type.

Vegetation mapping was primarily based on data collected from quadrats and relevés, and also took into account spatial data and vegetation mapping from previous surveys, particularly Onshore Environmental (2013) which adjoined the northern boundary of the Survey Area. Mapping notes were utilised to mark the boundaries of vegetation types in the field and to allow for more accurate delineation of these boundaries following the survey. A total of 27 mapping notes were collected during the survey to inform the vegetation mapping.

Vegetation types and boundaries were subsequently verified using both the data collected in the field and digital imagery. The vegetation type mapped for this assessment was given a unique code as per BHP's Vegetation and Flora Survey Procedure (no. 0124627, Version 3.0; BHP undated). Vegetation condition mapping was also prepared using the categories from BHP's Vegetation and Flora Survey Procedure (no. 0124627, Version 3.0; BHP undated).

Vegetation maps were created and consolidated using GIS software (QGIS and MapInfo Professional). All maps in this report were produced by the Biota GIS team.

[2] See the NVIS Information Hierarchy: https://www.dcceew.gov.au/environment/environment-information-australia/national-vegetation-information-system.

3.6.3 Searches for Significant Flora and Weeds

Targeted searches were conducted on foot in representative habitats throughout the Survey Area, focusing on significant species identified in the desktop study as having some likelihood to occur in the Survey Area (see Section 4.9.2). Track logs illustrating survey eeort are shown in Figure 3.2.

Locations of significant species were recorded using a handheld GPS unit. The number of individuals and extent of the population were also recorded for each location along with habitat and associated vegetation.

Locations of introduced flora species (weeds) were also recorded during the foot traverses, along with an actual count or estimate of their population size. These latter searches focused on weeds of management concern; i.e. Declared Pests (DPs) listed under the WA *Biosecurity and Agriculture Management Act 2007* (BAM Act) and Weeds of National Significance (WONS). Opportunistic records were also made of other non-listed weeds, however there was no attempt to document all such species through the entire Survey Area.

3.6.4 Opportunistic Records

Opportunistic records of flora species were also made during the survey to supplement the flora species list for the Survey Area (see Appendix 8). These records were made while en route to flora sampling sites, as well as during the foot traverses completed for vegetation mapping and targeted flora searches.

3.6.5 Specimen Identification, Nomenclature and Data Entry

Common taxa that were well known to the survey botanists were confirmed in the field. A voucher specimen was collected if the taxon was either dieicult to determine without closer examination, belonged to a recognised species complex, was poorly collected, or otherwise unusual. Voucher specimens of significant species were also collected for lodgement with the WA Herbarium, as required. Each voucher specimen was assigned a unique internal code to facilitate tracking of data. Specimens were pressed in the field and then returned to Perth for further examination and confirmation.

Voucher specimens were identified using all available flora keys, comparison with reference collections of specimens at the WA Herbarium, and in-house at Biota. Specimens were identified by Biota botanists with assistance from Pierre-Louis de Kock (consultant Specialist Taxonomist and Director of dK Botanical). Further assistance to resolve some specimen identifications was provided by Mike Hislop (Identification Botanist at the WA Herbarium).

Nomenclature and significance rankings for the described species used in this report are consistent with the current listing of WA flora recognised by the WA Herbarium on Florabase[3] at the time of writing.

All data were entered into a Microsoft Access database maintained at Biota, which was developed by Ted Griein at the request of Malcolm Trudgen (M.E. Trudgen & Associates).

3.6.6 Analysis of Flora Data

3.6.6.1 Sampling Adequacy

Plots of species accumulation curves can be used to assess sampling adequacy. When a survey has sampled an adequate proportion of the floristic assemblage, the curve should

[3] https://florabase.dbca.wa.gov.au/

plateau and approach asymptote. EstimateS (Colwell 2013) was used to calculate smoothed species accumulation curves based on 999 random permutations of the species data (native and introduced); only quadrat and relevé data were used.

Species accumulation curves alone cannot be reliably used to extrapolate predicted species richness for future biological sampling. In order to estimate asymptotic richness (i.e. an extrapolation of species richness) for the incidence data (i.e. presence, rather than abundance data), the Chao 2 Mean and ICE Mean estimators were also calculated using EstimateS.

3.6.6.2 Floristic Analysis

To assist with defining the vegetation types from the Survey Area, hierarchical clustering analyses were conducted in PRIMER v7 (Clarke and Gorley 2015) to assess the similarity of sampling sites based on floristic composition. A combined species list was generated from all sites in the survey. Taxon names and records were then rationalised as follows:

- Species recorded at only a single site were removed to reduce 'noise' in the data set; 48 such species (singletons) were excluded.
- Taxa that could potentially refer to more than one entity (e.g. "*Corchorus* sp.") were removed.

The rationalised table of species used in the analysis is provided in Appendix 7.

The analysis was conducted using percent cover data (square-root transformed). The Bray-Curtis measure of similarity was used to produce a similarity matrix, and the group average method for cluster analysis was used to determine floristic groups. Statistically dieerent groups were identified through similarity profile analysis (SIMPROF). The similarity percentage test (SIMPER) was used to determine which species contributed most to the similarities between groups.

Results were investigated through outputs including dendrograms (tree diagrams) of site similarity, and Non-metric Multi-Dimensional Scaling plots (NMDS plots). Selected inputs and outputs from the analyses are provided in Appendix 7.

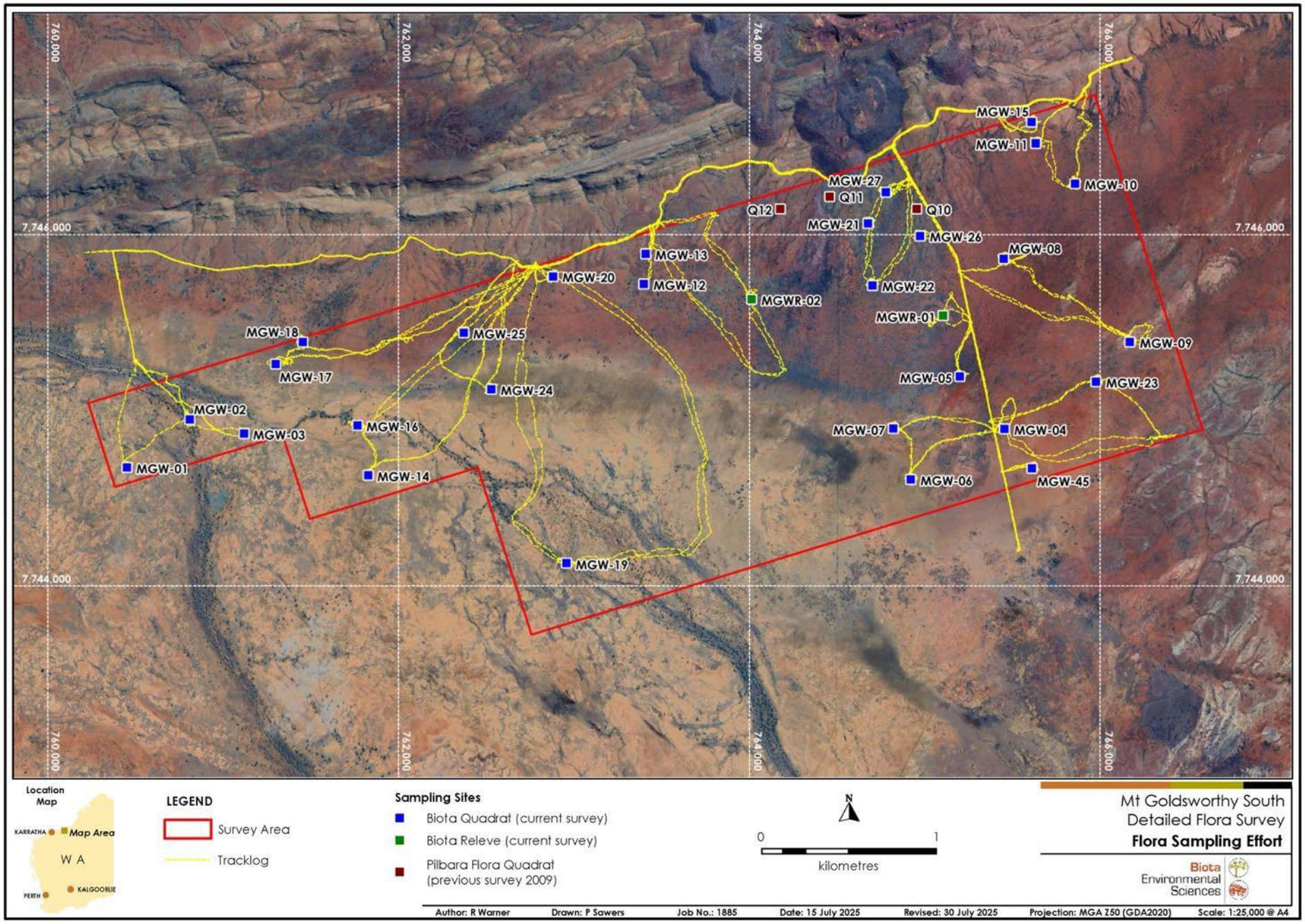

Figure 3.2: Location of flora sampling sites and survey e[ort.

3.7 Survey Limitations

The results of the field survey provide an adequate representation of the vegetation and flora values within the Survey Area. However, there are limitations to this study that must be considered when reviewing and applying the results detailed in this report. As per the EPA's Technical Guidance for flora surveys (EPA 2016a), potential constraints and consequent limitations of this study are summarised in Table 3.3.

Table 3.3: Assessment of potential limitations for this study.

Potential Limitation	Assessment
1. Availability of contextual information at a regional and local scale	Multiple surveys have been undertaken in the locality in the recent past. Onshore Environmental (2013) completed a single phase detailed survey of an area which adjoins the northern boundary of the Survey Area. Most recently, Biota (2024a) completed a reconnaissance and targeted flora and vegetation survey of a linear corridor <1 km north of the Survey Area. Contextual information was not a limitation for this study.
2. Competency/ experience of the team carrying out the survey, including experience in the bioregion surveyed	All field team members were suitably qualified to fulfill their role in the survey. The flora survey leader, Principal Scientist Rachel Warner, has 19 years of experience working as a botanist in the Pilbara. The other three field team members have five (Jason Teuber), four (Luisa Ducki) and one (Madeline West) year of experience. All team members had previously worked in the Pilbara bioregion. The team member with the least experience, Madeline West, always worked with a more experienced botanist. Numerous plant specimens were collected, and these were confirmed by specialist taxonomist Pierre-Louis de Kock (dK Botanical), who has 15 years of experience with Pilbara flora. There were no limitations due to experience of personnel.
3. Proportion of flora recorded and/or collected, any identification issues	All vascular flora encountered in the Survey Area were recorded. Conditions were optimal and most (89%) of the flora specimens collected during the field survey were of suUicient quality to be fully determined to the lowest relevant taxonomic level. A total of 19 specimens that had unusual features or were diUicult to identify in-house were submitted to the WA Herbarium for confirmation by taxonomist Mike Hislop. Fungi and non-vascular flora (algae, mosses and liverworts) were not systematically surveyed, which is consistent with the accepted level of eUort for a survey of this type and scale. The proportion of flora recorded was not considered a limitation of this study.
4. Appropriate area fully surveyed (eUort and extent)	Flora and vegetation sampling was undertaken through all representative habitats in the Survey Area, and a total of 28 quadrats, two relevés and 27 mapping notes were completed. In line with the requirements of a detailed survey as per EPA (2016a), replication of three sites per vegetation type was reached for all vegetation types apart from one, SP Tw AacAi. This was a spatially restricted unit in the north of the Survey Area, which was sampled with only two sites during the survey (note that Pilbara Flora (2009) sampled one additional site within this mapped unit). Targeted searches for significant flora were completed in representative areas of all prospective habitats. EUort and extent were not considered to be limitations.
5. Access restrictions within the Survey Area	Access tracks within the Survey Area were very limited, however all parts of the Survey Area could be accessed on foot, given its relatively small size. Access was not considered to be a significant limitation.

Potential Limitation	Assessment
6. Survey timing, rainfall, season of survey	The flora and vegetation survey was undertaken in late March 2025. This is in line with the recommended post-wet survey timing for flora and vegetation in the Pilbara region (as per EPA 2016a). Conditions at the time of the survey were optimal, with above-average rainfall in the preceding three months. Survey timing and rainfall were not limitations for the flora and vegetation survey.
7. Disturbance that may have aUected the results of survey such as fire, flood or clearing	The Survey Area was predominantly undisturbed, with minor clearing for access tracks (4.0 ha) and one section being a rehabilitated mine slope (0.8 ha). The majority of the Survey Area contained intact vegetation with minimal recent signs of fire, and no signs of repeated fires. Disturbance was not considered to be a limitation.

4.0 Desktop Study Results

4.1 IBRA Region and Subregion

The Interim Biogeographic Regionalisation for Australia (IBRA) recognises 89 bioregions and 419 biological subregions for Australia (DCCEEW 2025a). The Survey Area lies within the Pilbara bioregion (Figure 2.1); this region covers an area of 178,060 km^2 and is characterised by vast coastal plains and inland mountain ranges with clies and deep gorges. The vegetation is predominately mulga low woodlands or snappy gum over hummock grasses.

Two other bioregions, the Great Sandy Desert and Dampierland bioregions, occur within the broader Study Area to the north of the Survey Area (Figure 2.1).

The Survey Area intersects two Pilbara subregions, Roebourne (71.1%) in the west and Chichester (28.9 %) in the east as defined by IBRA, Version 7:

- Chichester (PIL1) – "Undulating Archaean granite and basalt plains include significant areas of basaltic ranges. Plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formerly *Triodia pungens*) hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges" (Kendrick and McKenzie 2003).
- Roebourne (PIL4) – "Quaternary alluvial and older colluvial coastal and sub-coastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia hummock* grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, Sporobolus and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite" (Kendrick and Stanley 2003).

4.2 Land Systems

Land systems are composed of repeating patterns of topography, soils and vegetation, which are described as a series of land units (Christian and Stewart 1953). Land systems mapping covering the Survey Area was prepared by van Vreeswyk et al. (2004) (Table 4.1). The Survey Area intersects four land systems:

- Capricorn land system, characterised by hills and ridges of sandstone.
- Nita land system, characterised by sandplains.
- Paradise land system, characterised by alluvial plains.
- Ruth land system, characterised by hills and ridges of volcanic and other rocks.

One additional mapping unit, RGEX_M, comprises a mapped disturbed area that is not described as a land system (DPIRD 2018).

Table 4.1: Description and extent of the land systems in the Survey Area.

Mapping Unit	Description	Extent in Survey Area ha (%)	Total Extent (ha)		Proportion of Extent in Combined Subregions (%)
			Chichester Subregion (PIL1)	Roebourne Subregion (PIL4)	
Capricorn land system (RGECPN)	Hills and ridges of sandstone and dolomite supporting low shrublands or shrubby spinifex grasslands.	49.7 (5.2)	482,691.0	10,305.5	<0.1
Nita land system (RGENIT)	Sandplains supporting shrubby spinifex grasslands with occasional trees.	375.4 (39.4)	35,258.3	1,442.2	1.0
Paradise land system (RGEPDS)	Alluvial plains supporting soft spinifex grasslands and tussock grasslands.	520.8 (54.7)	53,606.2	94,517.3	0.4
Ruth land system (RGERUT)	Hills and ridges of volcanic and other rocks supporting hard spinifex (occasionally soft spinifex) grasslands.	2.8 (0.3)	137,147.0	32,223.8	<0.1
Mine (RGEX_M)	Disturbed area, mines, mullock dumps etc.	3.0 (0.3)	2,342.6	17.9	0.1
	Total	**951.7 (100.0)**			

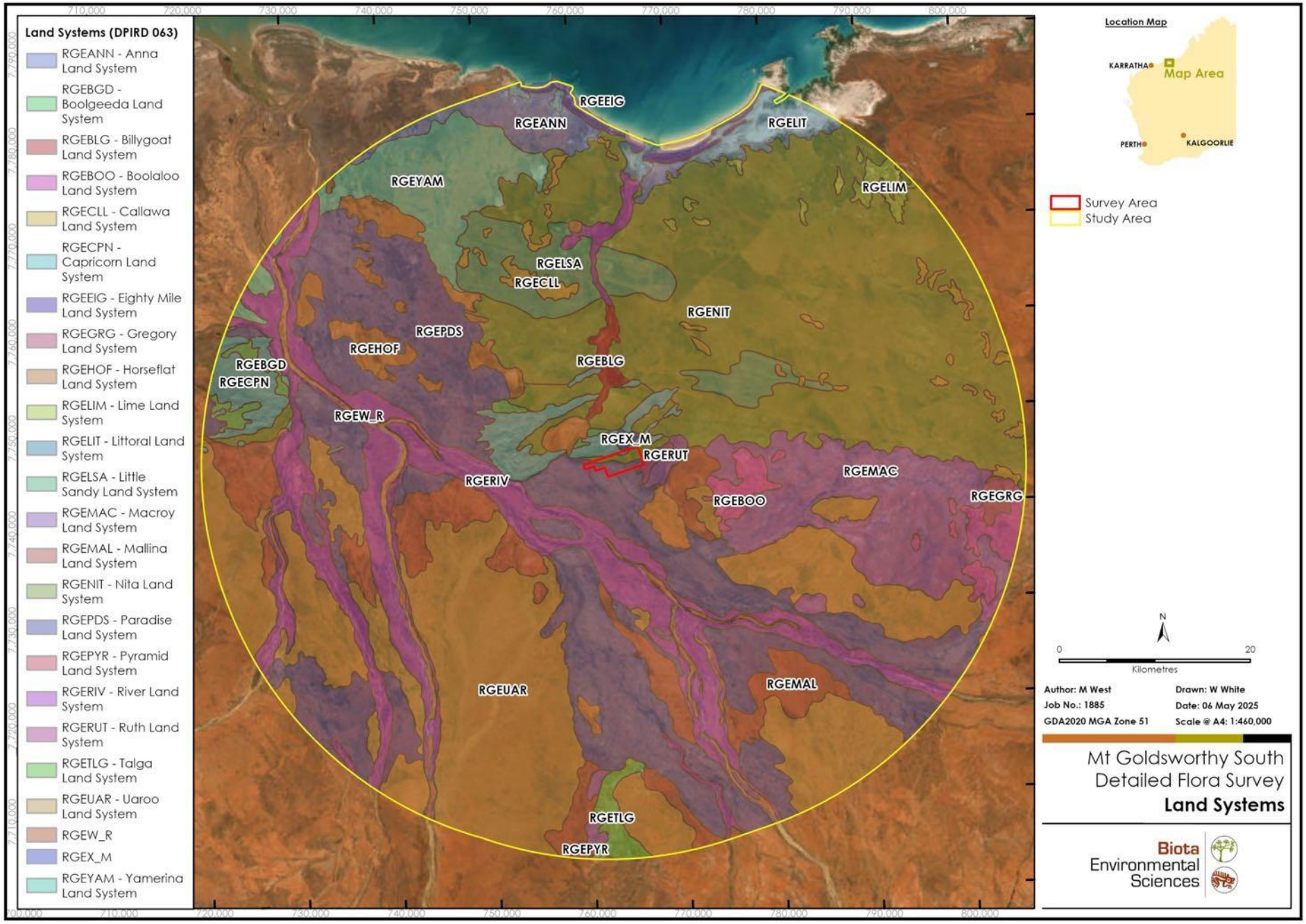

Figure 4.1: Land systems in the Study Area.

4.3 Geology

Mapping of the surface geological units in the locality was prepared based on data from Stewart et al. (2008) (Table 4.2). The Survey Area intersects three broad geological units:

- Unit Abw: *"Chert, ferruginous chert, banded iron formation, jaspilite; minor siltstone, shale, sandstone, pebbly sandstone, quartzite, polymictic conglomerate, felsic volcaniclastic rock, basalt, ultramafic schist, mafic schist."*
- Unit Qa: *"Basalt, komatiitic basalt; locally pillowed; locally carbonated or schistose; local peridotite, serpentinite; metamorphosed."*
- Unit Acg: *"Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted."*

Units Qa and Abw were most common, each occupying near half of the Survey Area (52.9% and 46.2%, respectively).

Table 4.2: Description and extent of the geological units in the Survey Area.

Geological Unit	Extent in Survey Area ha (%)	Total Extent (ha)		Proportion of Extent in Combined Subregions (%)
		Chichester Subregion (PIL1)	Roebourne Subregion (PIL4)	
Abw	440.0 (46.2)	20,128.5	589.3	2.1
Acg	8.3 (0.9)	68,484.5	10,288.1	<0.1
Qa	503.4 (52.9)	751,955.5	890,077.7	<0.1
Total	**951.7 (100.0)**			

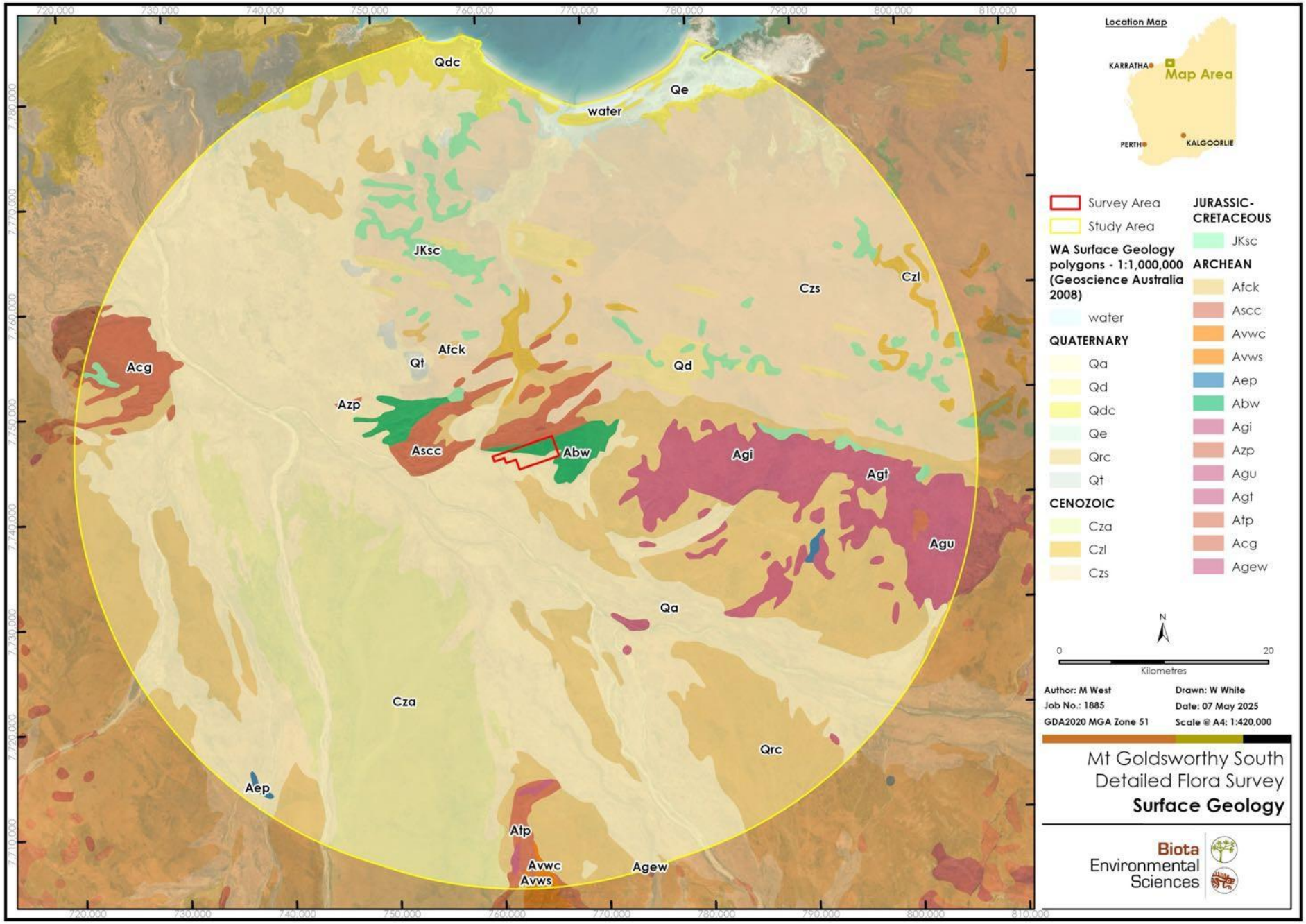

Figure 4.2: **Surface geology of the Study Area.**

4.4 Soil

Soil units have been mapped by Northcote et al. (1960). Three broad soil units occur within the Survey Area (Table 4.3):

- Oc40 is characterised by *"Alluvial plains, which are frequently badly surface-eroded, and levees associated with prior streams: chief soils are hard alkaline red soils (Dr2.33) and (Dr2.13), together with various sandy alkaline red soils including (Dr4.43) and (Dr4.33). There are small areas of sandy (Uc) soils on levees and prior stream channels, and also small areas of red dune soils (Uc5.11); and some sandy red earths (Gn). In places erosion has removed the sandy surfaces, and the resulting clay pans have sandy clay (Uf1.43) soils."*
- My54 is characterised by *"Broad very gently undulating plains with scattered rock outcrops occurring as mesas: chief soils are neutral and acid red earths (Gn2.12, Gn2.11) with some hard red soils (Dr) occurring on pediments of unit Oc61."*
- Oc61 is characterised by *"Dissected pediments and steep residual hills with iron formations: chief soils are hard alkaline red soils, probably (Dr2.33). Associated are various (Um) and (Uc) soils on the residual hills."*

Soil unit Oc40 was most common, occupying 65.6% of the Survey Area.

Table 4.3: Description and extent of the soil units in the Survey Area.

Soil Unit	Extent in Survey Area ha (%)	Total Extent (ha)		Proportion of Extent in Combined Subregions (%)
		Chichester Subregion (PIL1)	Roebourne Subregion (PIL4)	
My54	248.9 (26.2)	541,089.6	1,418.8	<0.1
Oc40	624.6 (65.6)	58,011.6	234.0	1.1
Oc61	78.2 (8.2)	67,571.2	8,943.8	0.1
Total	**951.7 (100.0)**			

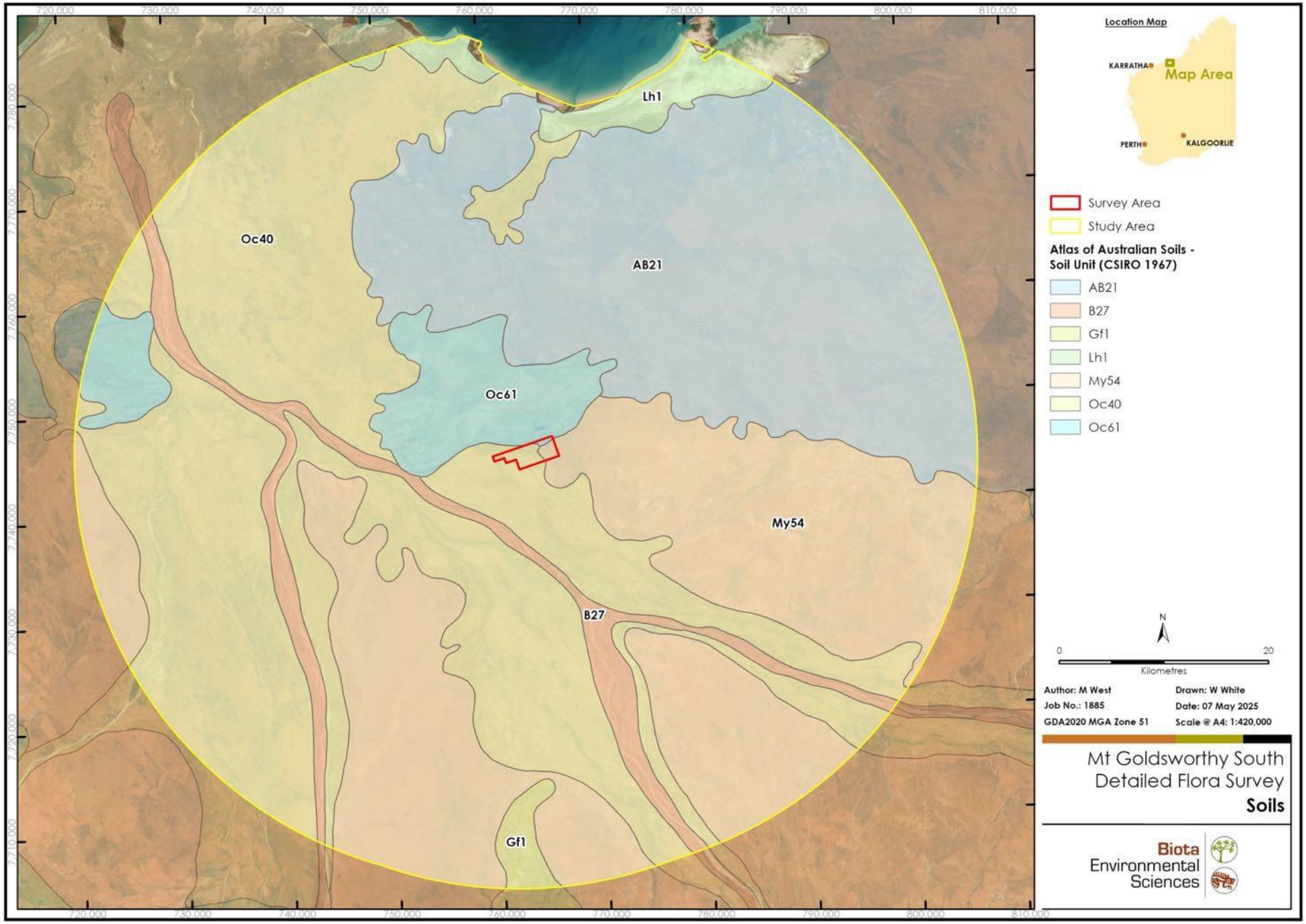

Figure 4.3: Soils of the Study Area.

4.5 Beard's Vegetation

Broad-scale vegetation mapping for the locality has been prepared at 1:1,000,000 scale by J.S. Beard (1975). The Survey Area intersects two of Beard's vegetation system associations (Table 4.4).

The dominant unit is Abydos Plain 175, which covers more than two-thirds of the Survey Area. This unit is characterised by annual grasses.

The pre-European and current extents of Beard's vegetation associations were last calculated in 2018 using interpretation of imagery to determine areas that had been cleared (Shepherd et al. 2002, Government of Western Australia 2019). These sources indicated that, in 2018, over 98% of the extent of both units remained uncleared.

Table 4.4: Description and extent of Beard's vegetation associations in the Survey Area.

Beard's Vegetation System Association	Description	Extent in Survey Area ha (%)	Total Extent (ha)		Proportion of Extent in Combined Subregions (%)
			Chichester Subregion (PIL1)	Roebourne Subregion (PIL4)	
Abydos Plain – Chichester 93	Hummock grassland, shrubs-steppe; Kanji (*Acacia inaequilatera*) over soft spinifex (*Triodia epactia*).	289.3 (30.4)	2,478,170.9	151.9	<0.0
Abydos Plain 175	Annual grasses (*Enneapogon* spp., *Aristida* spp. etc) on dry plains and saltwater grasses *Sporobolus virginicus* on the coast.	662.4 (69.6)	728.5	23,414.2	2.7
	Total	**951.7 (100.0)**			

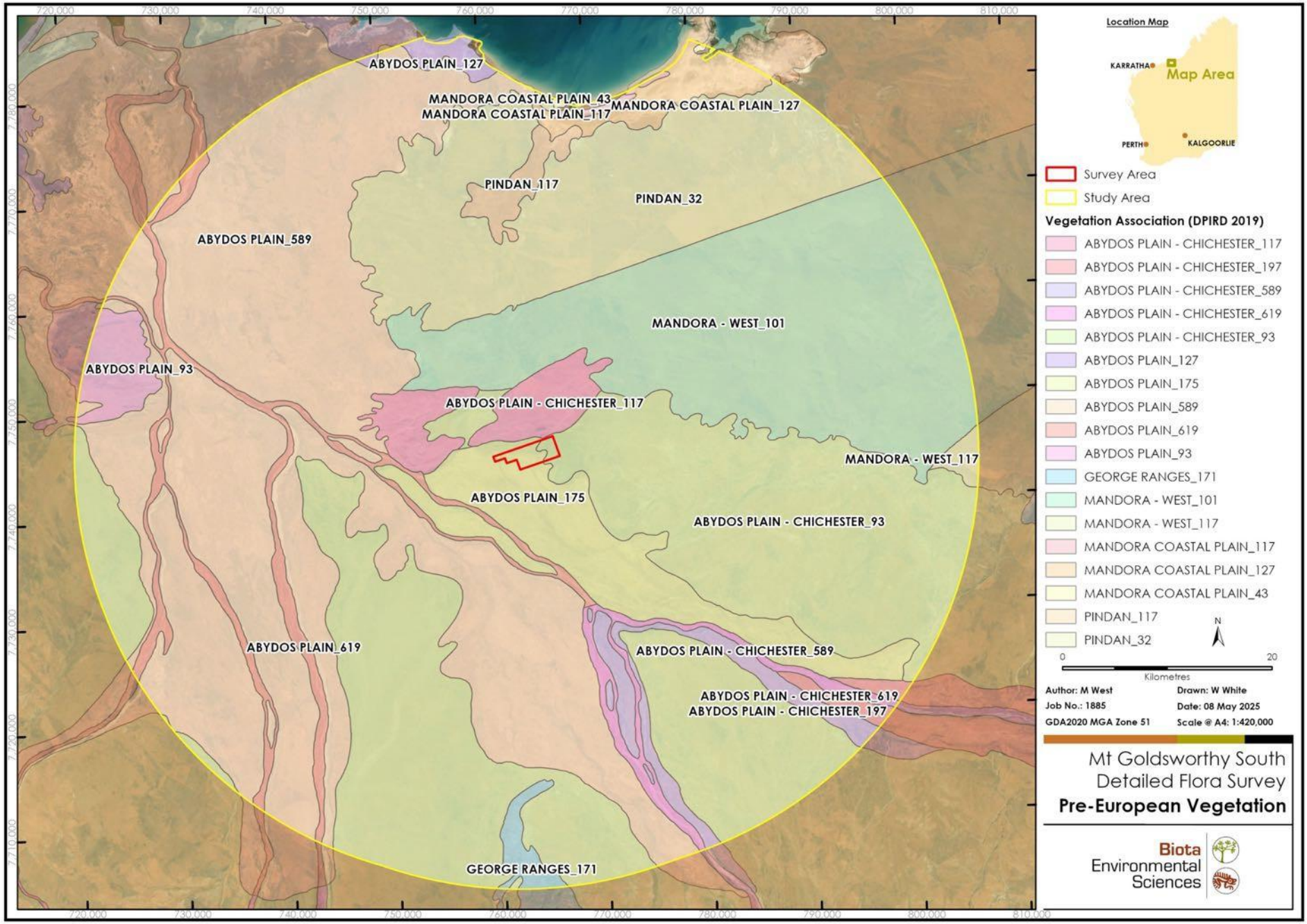

Figure 4.4: Pre-European vegetation associations of the Study Area.

4.6 Surface Hydrology

The De Grey River is the most prominent hydrological feature intersecting the Study Area, representing a key component of the broader surface water network within the Pilbara region of WA (Figure 4.5). This is listed on the Directory of Important Wetlands in Australia (DIWA) (DCCEEW 2025b) (see Figure 4.6). As a major perennial system, the De Grey River supports a range of aquatic and riparian habitats, which are of high ecological significance (McFarlane 2015).

Pardoo Creek joins the De Grey River and intersects the Survey Area itself (Figure 4.5). Despite being smaller in scale and having intermittent flow, this system contributes appreciably to the regional drainage network.

There are also a number of minor drainage lines within the Survey Area. These are all ephemeral, with water flow predominantly occurring from north to south in direct response to precipitation events. This flow is partly driven by channelised runoe from the ranges to the north of the Survey Area. This pattern is characteristic of arid and semi-arid regions, where hydrological regimes are defined by high inter-annual variability and short-lived surface water presence (EPA 1988). During seasonal rainfall, these minor drainage lines, along with Pardoo Creek, transport surface water within the Survey Area; from the steep, rocky upper slopes at the base of the northern ranges to the flat, low-lying, clay-rich areas in the south, which support diverse grassland communities.

4.7 Conservation Areas

Eighty Mile Beach Marine Park is the only conservation area in the locality (Figure 4.6). It lies 27.9 km to the north of the Survey Area. The marine park includes Eighty Mile Beach, Cape Keraudren and the diverse marine environments west of Cape Keraudren to Mulla Mulla Down Creek. The marine park covers over 200,000 ha in the region and is characterised by tussock and spinifex grasslands on beach foredunes, longitudinal coastal dunes, and near-coastal sandy plains just inland of Eighty Mile Beach.

The De Grey River intersects the desktop Study Area (Figure 4.6) and is listed on the Directory of Important Wetlands of Australia (DAWE 2021); it is also listed as an Environmentally Sensitive Area (ESA) under the EP Act (DWER 2021).

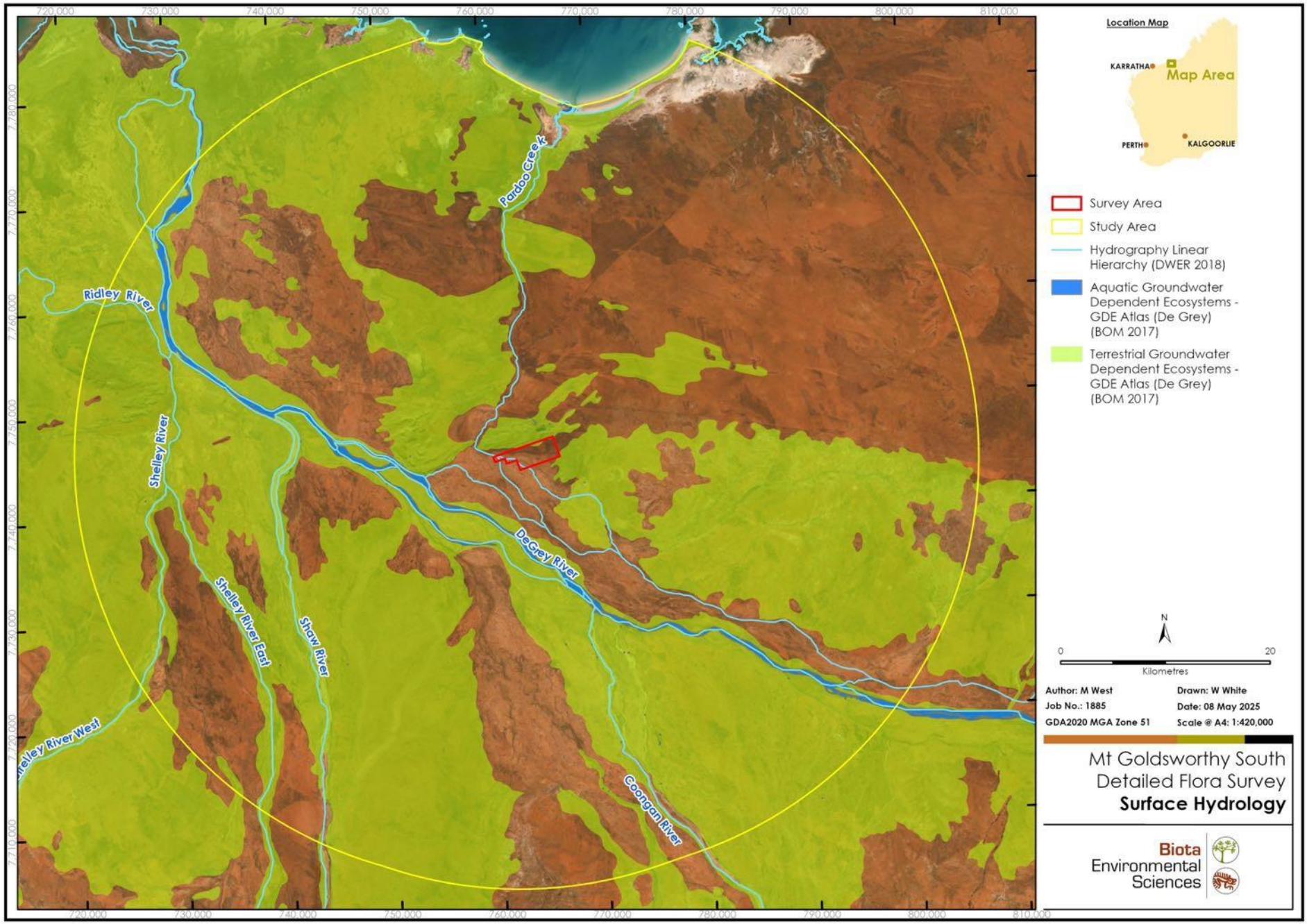

Figure 4.5: Surface hydrology of the Study Area.

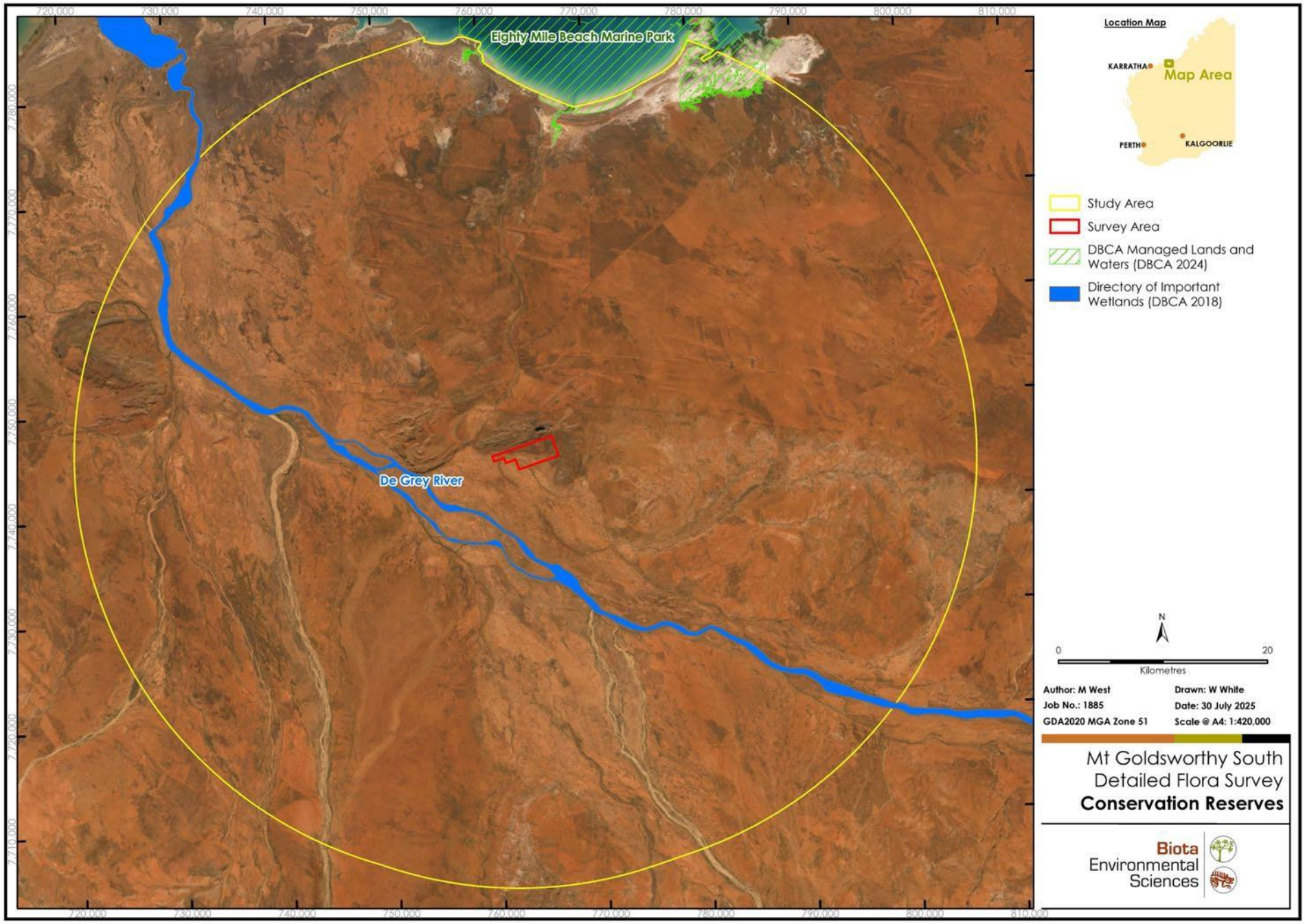

Figure 4.6: Conservation reserves and DIWA wetlands in the Study Area.

4.8 Literature Review

A summary of previous studies and surveys completed in the locality is presented in Table 4.5.

Note that due to the large extent of some surveys, some significant species records were distant from the Study Area, and on the basis of their currently known distribution would not be expected to occur in the Survey Area. Significant flora species with records within 40 km of the Survey Area were automatically included in the likelihood of occurrence assessment in Appendix 3. Six species were excluded from further consideration as they were recorded well outside the Study Area, and/or their known distributions do not extend to the Survey Area and no suitable habitat appeared to be present (i.e. *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095), *Euploca mutica, Goodenia hartiana, Indigofera ammobia, Polymeria* sp. Broome (K.F. Kenneally 9759) and *Tephrosia rosea* var. Port Hedland (A.S. George 1114)). Some species were included in the likelihood of occurrence assessment, despite having no records in the Study Area, as their known distribution encompassed the Survey Area and suitable habitat was potentially present (i.e. *Bonamia oblongifolia* and *Gymnanthera cunninghamii*) and/or they were not considered adequately surveyed (i.e. *Tribulopis marliesiae*).

Table 4.5: Relevant flora surveys conducted previously in the locality of the Survey Area.

† Denotes that species was not recorded within the current Study Area.

[1] Comprises species listed as WONS (Weeds Australia 2025) and Declared Pests under the BAM Act (DPIRD 2025).

Survey	Survey Size and Location	Flora Survey Type	Survey Timing	Survey Limitations	Native Flora Records	Significant Native Flora Communities / Species †	Significant Weeds [1]
Atlas Ridley Magnetite Project Connection - Flora and Fauna Survey Technical Report (SLR Consulting 2024)	• 10,363 ha. • 40 km northwest of the Survey Area.	Detailed and targeted survey.	1st – 10th March 2024	Lack of specimens identified to species level due to poor seasonal conditions during survey.	172 flora species from 94 genera and 50 families.	No TECs/PECs. No Threatened flora species recorded. Two Priority flora species recorded, neither within the current Study Area: • *Tephrosia rosea* var. Port Hedland (A.S. George 1114) † (Priority 1); • *Gymnanthera cunninghamii* † (Priority 3).	Declared Pests: • **Calotropis procera*
Unpublished survey data (Biota 2024a)	• 50,119.4 ha • As close as 200 m north of the Survey Area.	Reconnaissance and targeted flora and vegetation survey.	2nd – 13th May 2024	Lack of specimens identified to species level due to poor seasonal conditions during survey.	420 flora species from 148 genera and 51 families.	No TECs/PECs. Riparian vegetation of the De Grey River identified as high potential to be GDE/GDV. 10 Priority flora species recorded: • one Priority 2 species (*Goodenia hartiana* †); and • eight Priority 3 species (*Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) †, *Bonamia oblongifolia* †, *Euphorbia clementii, Euphorbia inappendiculata* var. *inappendiculata*, *Euphorbia inappendiculata* var. *queenslandica*, *Indigofera ammobia* †, *Polymeria* sp. Broome (K.F. Kenneally 9759) †, and *Tribulopis marliesiae* †); and • one Priority 4 species (*Bulbostylis burbidgeae*).	WONS: • **Parkinsonia aculeata* Declared Pests: • **Parkinsonia aculeata* • **Calotropis procera*
Detailed Flora and Vegetation Survey, Pardoo/Ridley (Focused Vision 2022)	• 11,060 ha. • 35 km northwest of the Survey Area.	Detailed and targeted flora survey.	2022, two mobilisations: • 24th -29th May • 27th June – 1st July	Pastoral disturbance may have afected the results.	252 flora species from 131 genera and 42 families.	No TECs/PECs. No Threatened flora species recorded. One Priority flora species recorded: • *Rothia indica* subsp. *australis* (Priority 3).	WONS: • **Parkinsonia aculeata* Declared Pests: • **Parkinsonia aculeata* • **Calotropis procera*
Flora and Vegetation Survey Goldsworthy (Onshore Environmental 2013)	• 6,900 ha • Adjacent to the northern boundary of the Survey Area.	Single-phase detailed flora survey.	1st – 11th September 2012	Average seasonal conditions.	286 flora species from 136 genera and 44 families.	No TECs/PECs. No Threatened or Priority flora species recorded.	WONS: • **Tamarix aphylla* Declared Pests: • **Calotropis procera*
Canning Basin Borefield and Pipeline Single Phase Flora and Vegetation Assessment (Ecologia 2012)	• 62,484 ha. • 9 km north of the Survey Area.	Detailed flora survey.	12th – 16th October 2011	Lack of specimens identified to species level due to poor seasonal conditions during survey.	282 flora species from 129 genera and 44 families.	No TECs/PECs. No Threatened flora species recorded. One Priority flora species recorded: • *Euploca mutica* (Priority 3) †.	WONS: • **Parkinsonia aculeata* Declared Pests: • **Parkinsonia aculeata* • **Calotropis procera*
BHP Billiton Iron Ore Rail Operations Biodiversity - Flora Survey Goldsworthy Junction to Yarrie (Ecologia 2011)	• Rail lease, 80-100 m wide by 200 km long. • 9.4 km south of the Survey Area.	Single-phase detailed flora survey.	17th – 26th March 2010	None listed.	313 flora species from 136 genera and 49 families.	No TECs/PECs. No Threatened flora species recorded. One Priority flora species recorded: • *Bulbostylis burbidgeae* (Priority 4).	WONS: • **Parkinsonia aculeata* • **Tamarix aphylla* Declared Pests: • **Parkinsonia aculeata* • **Calotropis procera*
Flora and Vegetation Survey of the Goldsworthy Minesite (Pilbara Flora 2009)	• 1,236 ha. • Intersects the northern section of the Survey Area near the mine void, and continues north; three quadrats within the current Survey Area.	Single-phase detailed flora survey.	10th – 20th June 2008	Fire disturbance and poor seasonal conditions.	188 flora species from 88 genera and 40 families.	No TECs/PECs. No Threatened flora species recorded. One Priority flora species recorded: • *Euphorbia clementii* (Priority 3).	WONS: • **Parkinsonia aculeata* • **Tamarix aphylla* Declared Pests: • **Parkinsonia aculeata* • **Calotropis procera*

Survey	Survey Size and Location	Flora Survey Type	Survey Timing	Survey Limitations	Native Flora Records	Significant Native Flora Communities / Species †	Significant Weeds [1]
Ord Ridley Exploration Lease Flora and Vegetation Assessment (ENV 2007)	• 1,400 ha. • 39 km northwest of the Survey Area.	Single-phase detailed and basic flora survey.	28th March – 3rd April 2007	Poor seasonal conditions.	153 flora species from 88 genera and 38 families.	No TECs/PECs. No Threatened or Priority flora recorded.	WONS: • **Parkinsonia aculeata*

4.9 Factors of Environmental Significance

4.9.1 Significant Vegetation in the Locality

No TECs or PECs are known to occur in the Survey Area. Two Priority 3 PECs occur in the wider Study Area, as follows:

- **Eighty Mile Land System** **Priority 3**

  "Beach foredunes, longitudinal coastal dunes, and sandy plains with tussock grasslands and spinifex grasslands" (DBCA 2023a). Listed threats to this PEC are altered fire regimes, overgrazing, erosion, and weed invasion (**Cenchrus ciliaris*).

  This community occurs at the northern boundary of the Study Area, 29.5 km north of the northernmost extent of the Survey Area.

- **Lake Gregory Land System** **Priority 3**

  "Lakes and surrounding alluvial floodplains supporting tussock and hummock grasslands and scattered shrubs and trees" (DBCA 2023a). Listed threats to this PEC are altered fire regimes leading to loss of trees and shrubs, overgrazing by cattle and feral horses, and severe weed invasion (**Cenchrus ciliaris* and **Aerva javanica* on dunes).

  This community lies near the eastern boundary of the Study Area, 35.2 km east-southeast of the easternmost extent of the Survey Area.

4.9.2 Significant Flora in the Locality

No Threatened flora are known to occur in the locality.

A total of 18 Priority flora species were identified through the review of previous survey reports and government database searches. Four of the species that were only represented by distant records were not considered further for the likelihood of occurrence assessment (see Section 4.8). The 14 remaining species comprised three Priority 1, nine Priority 3 and two Priority 4 species (see Appendix 3). Database search records are shown on Figure 4.7, where possible (noting that the locations of some records were not accessible).

4.9.2.1 Significant Flora with the Potential to Occur in the Survey Area

One Priority 3 species, *Euphorbia clementii*, was previously recorded in the northeastern section of the Survey Area by Pilbara Flora (2009) (Figure 4.7). Suitable habitat for this species would be widespread in the Survey Area.

Two other Priority species were considered to have a high likelihood of occurrence, and were ranked as "likely to occur":

- *Euphorbia inappendiculata* var. *inappendiculata* (P3); and
- *Euphorbia inappendiculata* var. *queenslandica* (P3).

It was considered that another eight Priority species had a moderate likelihood of occurrence, and "may occur" in the Survey Area:

- *Corchorus* sp. Yarrie (J. Bull & D. Roberts CAL 01.05) (P1);
- *Euploca parviantrum* (P1);
- *Triodia degreyensis* (P1);

- *Bonamia oblongifolia* (P3);
- *Gymnanthera cunninghamii* (P3);
- *Heliotropium murinum* (P3);
- *Rothia indica* subsp. *australis* (P3); and
- *Bulbostylis burbidgeae* (P4).

The species listed above formed the target species for the field survey.

4.9.2.2 Significant Flora with a Low Likelihood of Occurrence

The desktop study identified the remaining Priority species as having a low likelihood of occurrence in the Survey Area (i.e. the species were ranked as 'unlikely to occur'). This was generally due to an apparent lack of suitable habitat in the Survey Area, a known distribution that did not extend to the Survey Area, and/or a lack of any confirmed records from the locality despite an appropriate level of survey eeort (see Appendix 3).

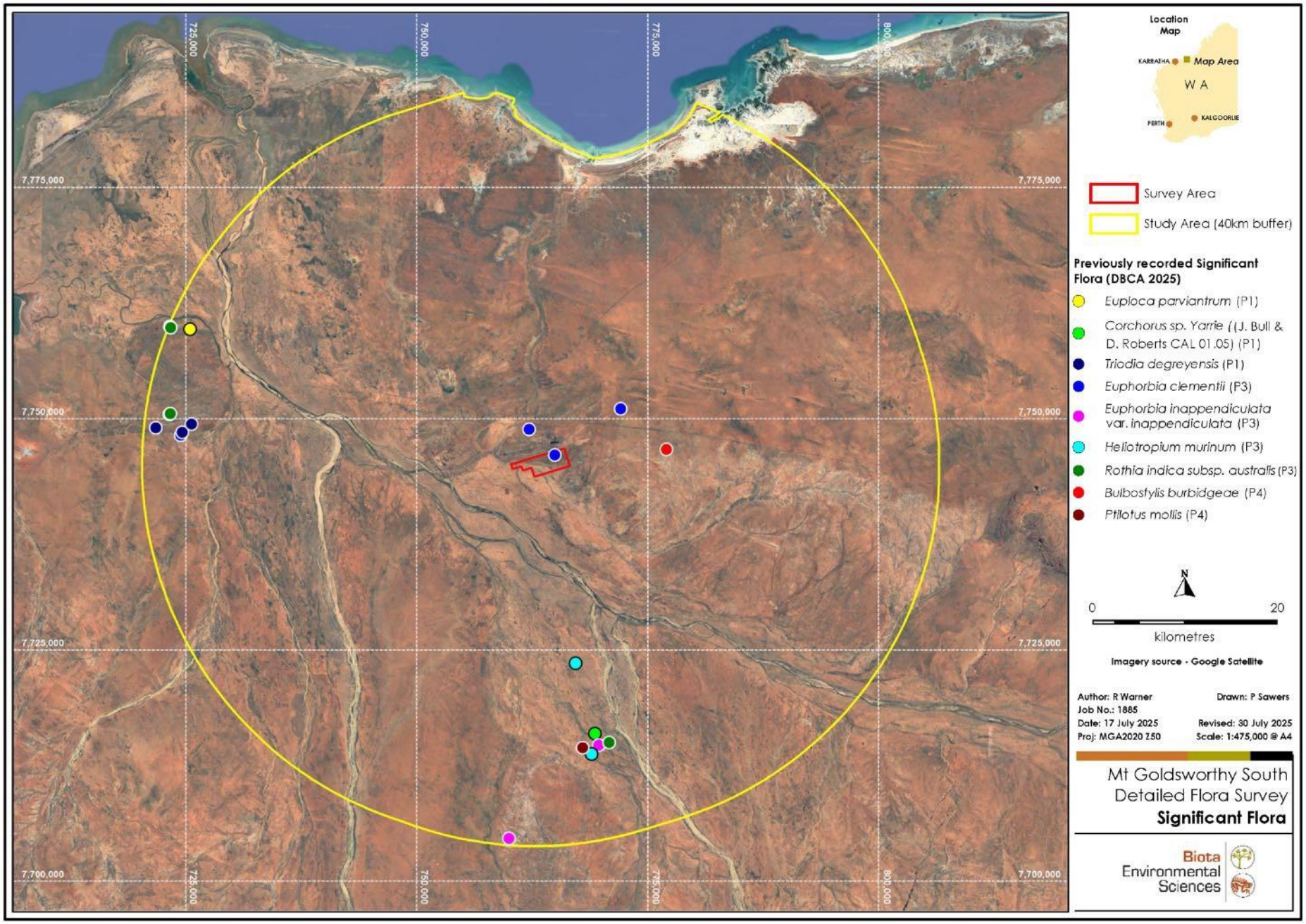

Figure 4.7: **Previous significant flora records from the Study Area from the DBCA database and Pilbara Flora (2009).**
NB. Records generalised to two or less decimal places have not been mapped.

5.0 Field Survey Results

5.1 Vegetation

5.1.1 Broad Floristic Formations

Four broad floristic formations were described within the Survey Area, based on the dominant growth form and genus of the dominant stratum:

- *Eragrostis* closed tussock grassland.
- *Eucalyptus* low open woodland.
- *Triodia* open hummock grassland.
- *Triodia* very open hummock grassland.

The dominant broad floristic formation (based on extent in the Survey Area) was the *Triodia* open hummock grassland, corresponding to two vegetation associations (555.0 ha, 58.3% of the Survey Area; Table 5.1). This association occurred on the sandy plains and stony plains landforms in the northeastern half of the Survey Area (Figure 5.1).

5.1.2 Overview of Vegetation Associations

Remnant native vegetation accounted for 99.5% of the Survey Area and consisted of five intact vegetation associations (described to Level V according to the NVIS; see Section 5.1.3). The extents of the vegetation associations within the Survey Area are shown in Table 5.1 and Figure 5.1.

The remaining 0.5% of the Survey Area consisted of two modified units totalling 4.8 ha:

- Cleared land (C): areas (4.0 ha) devoid of native vegetation including tracks, and an old mining overburden storage area slope in the north of the Survey Area; and
- Rehabilitation (R): a small area (0.8 ha) of rehabilitated mine slope which supported mixed *Acacia* spp., native tussock grasses and *Triodia* spp.

Table 5.1: Extent and description of the vegetation associations mapped in the Survey Area.

Vegetation Code	Broad Floristic F	Description	Overall Extent in the Survey Area	
			Area (ha)	Proportion (%)
Remnant Native Vegetation Associations				
SS TeTsc AacAancAi ChCflCoz	*Triodia* open hummock grassland	Open Hummock Grassland of *Triodia epactia* and *T. schinzii* with an Open Shrubland to High Open Shrubland of *Acacia acradenia, A. ancistrocarpa* and *A. inaequilatera* with Scattered Low Trees of *Corymbia hamersleyana, C. flavescens* and *C. zygophylla* on red sands and sandy loams on sandy and stony plains.	537.3	56.5
GP ErxErbErgg DishErte	*Eragrostis* closed tussock grassland	Closed Tussock to Tussock Grassland of *Eragrostis xerophila, Eriachne benthamii* and *Eriachne glauca* var. *glauca* with an Open Bunch Grassland of *Dichanthium sericeum* subsp. *humilius* and *Eragrostis tenellula* on yellow to red gilgai clay plains.	246.1	25.9
ME Ev AsyAcoAthe EuaErbChf Cyv	*Eucalyptus* low open woodland	Low Open Woodland of *Eucalyptus victrix* with a High Open Shrubland of *Acacia synchronicia*, *Acacia colei* and *Atalaya hemiglauca* with a Tussock Grassland of *Eulalia aurea*, *Eriachne benthamii* and *Chrysopogon fallax* and Scattered Sedges of *Cyperus vaginatus* on reddish brown light to medium clay in a moderate creekline.	56.5	5.9
FP Te Ev ChfErbErx	*Triodia* very open hummock grassland	Very Open Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Eucalyptus victrix* with a Very Open Tussock Grassland of *Chrysopogon fallax, Eriachne benthamii* and *Eragrostis xerophila* on reddish brown light to medium clay on floodplains.	89.3	9.3
SP Tw AacAi	*Triodia* open hummock grassland	Open Hummock Grassland of *Triodia wiseana* with Scattered Shrubs of *Acacia acradenia* and *A. inaequilatera* on reddish brown sandy loam on stony low rises at the footslopes of medium ranges.	17.7	1.9
Other Mapping Units				
OT (C)	–	Cleared (C): completely devoid of vegetation; comprising tracks.	4.0	0.4
OT (R)	–	Rehabilitation (R): rehabilitated mine slopes consisting of scattered shrubs of mixed *Acacia* spp., native tussock grasses and *Triodia* hummocks.	0.8	0.1
		Total	**951.7**	**100.0**

5.1.3 Description of Vegetation Associations

Code	SS TeTsc AacAancAi ChCflCoz
Vegetation association description (NVIS Level V)	Open Hummock Grassland of *Triodia epactia* and *T. schinzii* with an Open Shrubland to High Open Shrubland of *Acacia acradenia, A. ancistrocarpa* and *A. inaequilatera* with Scattered Low Trees of *Corymbia hamersleyana, C. flavescens* and *C. zygophylla.*
Distribution and landforms	This vegetation occurred on red sands (and very occasionally sandy loams) on the sandy and stony plains that dominated the Survey Area (Plate 5.1). This unit was mapped in the northeastern half of the Survey Area (Figure 5.1), and was associated predominantly with the Nita land system. The vegetation occurred mostly on sandy soils that lacked a rocky surface, however there were scattered small pockets of this unit on low stony rises. This broad area lies at the base of medium ranges and is a depositional surface, sloping gently to the south. The vegetation was dissected by minor flowlines dominated by *Acacia* spp. (e.g. *Acacia monticola, Acacia ancistrocarpa)* that were too small to be mapped separately. The hummock grass *Triodia schinzii* occurred patchily though this unit (e.g. sites MGW-08, MGW-10 and MGW-11), with *Triodia epactia* otherwise dominant. The low mallee tree *Eucalyptus odontocarpa* occurred in an isolated patch in the northwestern corner of the Survey Area.
Other associated species	Mallee: *Eucalyptus odontocarpa.* Tall Shrubs: *Acacia monticola*, *Grevillea pyramidalis* subsp. *leucadendron.* Shrubs: *Carissa lanceolata, Grevillea wickhamii, Senna artemisioides* subsp. *oligophylla*. Low Shrubs: *Acacia stellaticeps, Bonamia erecta*, *Corchorus sidoides* subsp. *vermicularis, Hibiscus sturtii* var. *campylochlamys, Isotropis atropurpurea, Senna notabilis, Sida* sp. Pilbara (A.A. Mitchell PRP 1543). Herbs: *Afrohybanthus aurantiacus*, *Arivela viscosa*, *Boerhavi*a spp., *Bonamia pannosa, Euphorbia vaccaria* var. *vaccaria, Goodenia microptera, Grona filiformis, Indigofera linifolia, Polymeria ambigua, Portulaca oleracea, Ptilotus axillaris, Ptilotus fusiformis, Trianthema pilosum, Tribulus hirsutus, Tribulopis angustifolia, Trigastrotheca molluginea.* Sedges: *Bulbostylis barbata.* Grasses: *Aristida holathera* var. *holathera*, **Cenchrus ciliaris, Chrysopogon fallax, Eragrostis eriopoda, Eriachne obtusa, Panicum australiense* var. *australiense, Paspalidium rarum, Sporobolus australasicus.*
Vegetation condition	Very Good, and in many places Excellent. Very occasional records of **Cenchrus ciliaris*, predominantly as scattered individuals and often under *Corymbia* trees. **Vachellia farnesiana* was recorded at one site, however it was otherwise rarely encountered within this vegetation. In some sections there was evidence of low intensity cattle activity (predominantly old scats and tracks). The majority of the vegetation had a moderate fire age (3-5 yr), however there were some patches that were burnt more recently (0-2 yr).
Sampling sites	MGW-04, MGW-05, MGW-07, MGW-08, MGW-09, MGW-10, MGW-11, MGW-12, MGW-13, MGW-15, MGW-18, MGW-20, MGW-22, MGW-23, MGW-25, MGW-26, MGW-R-01, MGW-R-02; also Q10 and Q12 of Pilbara Flora (2009).

Plate 5.1: Vegetation association SS TeTsc AacAancAi ChCflCoz.

Code	GP ErxErbErgg DishErte
Vegetation association description (NVIS Level V)	Closed Tussock to Tussock Grassland of *Eragrostis xerophila, Eriachne benthamii* and *Eriachne glauca* var. *glauca* with an Open Bunch Grassland of *Dichanthium sericeum* subsp. *humilius* and *Eragrostis tenellula*.
Distribution and landforms	This vegetation occurred on the yellow to red clay gilgai plains in the southern half of the Survey Area (Plate 5.2; Figure 5.1). The unit was associated with the Paradise land system, characterised by deposited alluvium and prone to flooding. No trees were present within this unit. Occasionally, the tall shrub *Acacia synchronicia* occurred as scattered individuals, or as a small dense stand in a few locations within this grassland unit. Grasses and herbs were dominant.
Other associated species	Tall Shrubs: *Acacia synchronicia.* Shrubs: *Sesbania cannabina.* Low Shrubs: *Sida fibulifera.* Herbs: *Bergia pedicellaris*, *Corchorus tridens*, *Euphorbia fitzroyensis*, *Grona muelleri*, *Ipomoea coptica, Marsilea hirsuta, Mimulus gracilis, Neptunia scutata, Nellica maderaspatensis, Ptilotus murrayi, Stemodia kingii, Streptoglossa tenuiflora, Vigna* sp. Hamersley Clay (A.A. Mitchell PRP 113). Sedges: *Bulbostylis turbinata, Cyperus iria.* Grasses: *Cynodon convergens*, *Dactyloctenium radulans*, *Elytrophorus spicatus*, *Iseilema membranaceum, Iseilema dolichotrichum*, *Panicum laevinode, Sporobolus australasicus*.
Vegetation condition	Very Good; in many places Excellent. There was no evidence of recent fire within this grassland unit. Occasionally, low intensity cattle activity was noted, however the majority was unimpacted. Weeds were rare, with only one record of **Vachellia farnesiana* and **Echinochloa colona* from this unit.
Sampling sites	MGW-06, MGW-14, MGW-24, MGW-45.

Plate 5.2: Vegetation association GP ErxErbErgg DishErte.

Code	ME Ev AsyAcoAthe EuaErbChf Cyv
Vegetation association description (NVIS Level V)	Low Open Woodland of *Eucalyptus victrix* with a High Open Shrubland of *Acacia synchronicia*, *Acacia colei* and *Atalaya hemiglauca* with a Tussock Grassland of *Eulalia aurea*, *Eriachne benthamii* and *Chrysopogon fallax* and Scattered Sedges of *Cyperus vaginatus.*
Distribution and landforms	This vegetation occurred on reddish brown light to medium clay within the moderate drainage line (Pardoo Creek) in the western section of the Survey Area (Plate 5.3; Figure 5.1). The drainage line was braided in places, with a well-defined channel that was either bare or contained a groundcover of herbs, bunch grasses and sedges. The banks were dominated by *Eucalyptus victrix* and native tussock grasses. The unit occurred within the Paradise land system.
Other associated species	Shrubs: *Carissa lanceolata*, *Ehretia saligna* var. *saligna*, **Vachellia farnesiana*. Low Shrubs: *Sesbania cannabina.* Herbs: *Alternanthera nodiflora, Ammannia multiflora*, *Basilicum polystachyon*, *Blumea tenella*, *Boerhavia burbidgeana, Centipeda minima* subsp. *minima*, *Euphorbia fitzroyensis*, *Ipomoea coptica*, *Ludwigia perennis*, *Marsilea hirsuta, Mimulus gracilis, Nellica maderaspatensis, Ptilotus murrayi, Rostellularia adscendens* var. *clementii, Uvedalia clementii, Vigna lanceolata* var. *lanceolata, Vigna* sp. Hamersley Clay (A.A. Mitchell PRP 113). Grasses: *Cynodon convergens*, *Dichanthium fecundum, Dichanthium sericeum* subsp. *humilius, *Echinochloa colona, Eragrostis exigua, Eriachne glauca* var. *glauca, Iseilema macratherum, Sporobolus australasicus.* Sedges: *Bulbostylis turbinata, Cyperus squarrosus, Fimbristylis littoralis, Fimbristylis microcarya.*
Vegetation condition	Very Good. Scattered weeds were recorded, comprising **Cenchrus ciliaris*, **Echinochloa colona, *Indigofera oblongifolia* and **Vachellia farnesiana*, but were not dominant within the vegetation. Low to moderate cattle activity was evident in places, however some sections of the creek appeared free from cattle impacts. There was no evidence of recent fire within this unit.
Sampling sites	MGW-02, MGW-16, MGW-19.

Plate 5.3: Vegetation association ME Ev AsyAcoAthe EuaErbChf Cyv (bed=left; bank=right).

Code	FP Te Ev ChfErbErx
Vegetation association description (NVIS Level V)	Very Open Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Eucalyptus victrix* with a Very Open Tussock Grassland of *Chrysopogon fallax, Eriachne benthamii* and *Eragrostis xerophila.*
Distribution and landforms	This vegetation occurred on reddish brown to yellow light to medium clay on the floodplains of the medium drainage line (Pardoo Creek) in the western section of the Survey Area (Plate 5.4; Figure 5.1). This unit occurred within the Paradise land system.
Other associated species	Shrubs: *Acacia synchronicia*, **Vachellia farnesiana.* Low Shrubs: *Senna artemisioides* subsp. *oligophylla*, *Sesbania cannabina.* Herbs: *Corchorus tridens, Euphorbia inappendiculata* var. *inappendiculata, Ipomoea coptica, Neptunia scutata, Pluchea rubelliflora, Portulaca oleracea, Ptilotus murrayi, Uvedalia clementii.* Grasses: **Cenchrus setiger, Chloris pectinata, Dactyloctenium radulans, Dichanthium sericeum* subsp. *humilius*, *Iseilema macratherum*, *Panicum laevinode, Paspalidium rarum, Sporobolus australasicus, Xerochloa laniflora.* Sedges: *Bulbostylis barbata, Bulbostylis turbinata, Cyperus iria, Fimbristylis dichotoma.*
Vegetation condition	Very Good. Scattered weeds were present, comprising **Cenchrus ciliaris*, **Cenchrus setiger*, **Echinochloa colona*, **Flaveria trinervia* and **Vachellia farnesiana*. Fire age was considered old (6+ yr). There were signs of low to moderate cattle activity through this unit (tracks and scats).
Sampling sites	MGW-01, MGW-03, MGW-17.

Plate 5.4: Vegetation association FP Te Ev ChfErbErx.

Code	SP Tw AacAi
Vegetation association description (NVIS Level V)	Open Hummock Grassland of *Triodia wiseana* with Scattered Shrubs of *Acacia acradenia* and *A. inaequilatera.*
Distribution and landforms	This small unit occurred on footslopes in the northeastern section of the Survey Area, at the base of the medium ranges that lie further north (Plate 5.5; Figure 5.1). It occurred within the Capricorn land system, which intersected this small section of the Survey Area. The soil was reddish brown sandy loam with a surface cover of ironstone rocks (pebbles and cobbles).
Other associated species	Shrubs: *Acacia ancistrocarpa*, *Grevillea pyramidalis* subsp. *leucadendron, Grevillea wickhamii.* Low Shrubs: *Sida* sp. Pilbara (A.A. Mitchell PRP 1543). Herbs: *Arivela viscosa*, *Crotalaria medicaginea* var. *neglecta, Dolichocarpa crouchiana, Euphorbia clementii, Goodenia microptera, Polygala glaucifolia, Trigastrotheca molluginea.* Grasses: *Aristida holathera* var. *holathera*, *Eriachne pulchella, Panicum australiense* var. *australiense.* Sedges: *Bulbostylis barbata.*
Vegetation condition	Excellent. No weeds or cattle activity were recorded within this unit. Time since fire was considered moderate (3 to 5 yr).
Sampling sites	MGW-21, MGW-27; also Q11 of Pilbara Flora (2009).

Plate 5.5: Vegetation association SP Tw AacAi.

5.1.4 Other Units

Two additional units were mapped separately to the vegetation associations: OT (R) (Rehabilitation) and OT (C) (Cleared):

- Unit OT (R) was mapped in a small area of rehabilitated mine slope in the northern part of the Survey Area. Juvenile shrubs of *Acacia* spp. were present along with native grasses and small hummocks of spinifex (*Triodia* spp.), however there was no discernible structure, and the slopes were very steep and mostly bare of vegetation (Plate 5.6).
- Unit OT (C) consisted of the cleared areas for the few minor access tracks that occurred within the Survey Area.

Plate 5.6: **Rehabilitated mine slope unit OT (R) (background=left; aerial view=right, with northern boundary of Survey Area shown in green).**

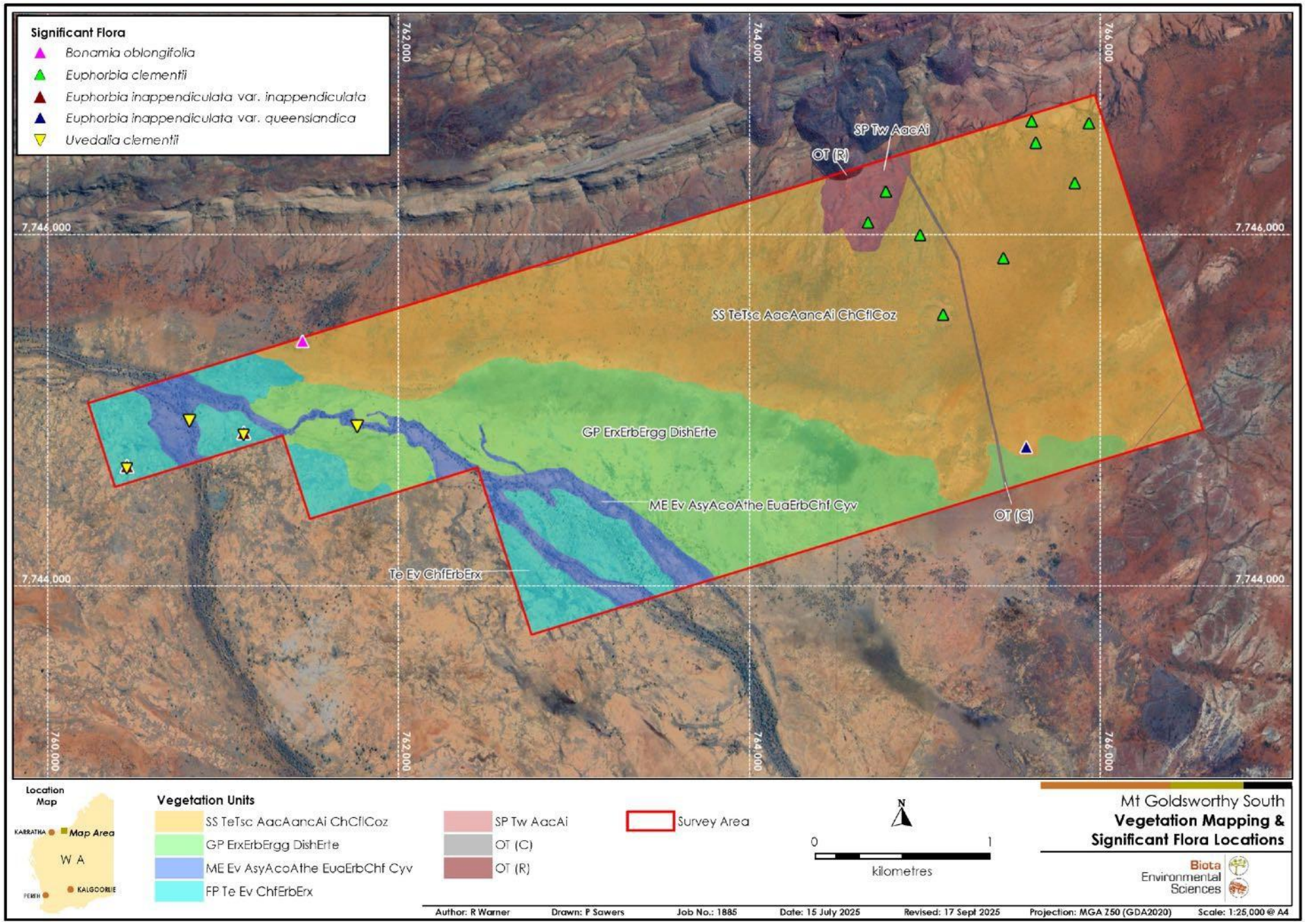

Figure 5.1: **Vegetation mapping of the Survey Area with locations of significant flora recorded by the current survey.**

5.1.5 Floristic Analysis: Validation of Vegetation Associations

At a nominal 32% level of similarity, the sampling sites were divided into six groups (Table 5.2). These showed clear connections between floristic composition and the vegetation associations described for the Survey Area (see Figure 1 to Figure 3 in Appendix 7). The floristic groups could be broadly discriminated by the presence and abundance of species in the tussock grass and spinifex strata, as well as some key eucalypt and wattle species (see Table 5.2).

The six floristic groups (FG_a to FG_f) are briefly described below:

- FG_a contained all four sites from the vegetation association that occurred throughout the gilgai clay plains of the Survey Area (GP ErxErbErgg DishErte). This group was characterised by various tussock and bunch grasses, particularly *Eragrostis xerophila*, *Eriachne benthamii, Eriachne glauca* var. *glauca, Dichanthium sericeum* subsp. *humilis* and *Iseilema* spp., as well as herbs characteristic of clay soil substrates. Whilst *Acacia synchronicia* occurred as scattered individuals in areas, and as a dense stand in a few locations within this grassland unit, it was absent from the majority of the unit, including these four sites.
- FG_b comprised the three sites sampled in Pardoo Creek, the medium drainage line in the Survey Area (ME Ev AsyAcoAthe EuaErbChf Cyv). This group was characterised by tussock grasses (*Eulalia aurea*, *Chrysopogon fallax* and *Eriachne benthamii*); as well as the low tree *Eucalyptus victrix* and the sedge *Cyperus vaginatus,* both of which are typical of riparian habitats.
- FG_c contained two of the sites (MGW-01 and MGW-03) that were sampled in the vegetation association that occurred on the floodplains adjacent to Pardoo Creek (FP Te Ev ChfErbErx); the third site on the floodplains grouped in FG_f due to the lack of *Chrysopogon fallax*. FG_c had similarities to the other floristic groups of more mesic habitats (FG_a and FG_b), and was characterised by the tussock grasses *Chrysopogon fallax* and *Eragrostis xerophila*, the low tree *Eucalyptus victrix*, and the hummock grass *Triodia epactia.*
- FG_d contained the two sites on the stony plains in the north of the Survey Area (SP Tw AacAi), at the footslopes of the medium ranges (the latter situated outside the Survey Area). This group was characterised by the dominance of *Triodia wiseana*.
- FG_e contained three sites (MGW-08, MGW-10, and MGW-11) on the sandy plains of the Survey Area within vegetation association SS TeTsc AacAancAi ChCflCoz; the remainder of the sites from this vegetation association occurred in FG_f. The hummock grass *Triodia schinzii* and the shrub *Acacia ancistrocarpa* particularly characterised FG_e, and were relatively more abundant than in the sites in FG_f; *Triodia epactia* was also less abundant in the sites in FG_e than in FG_f, and was another factor separating these floristic groups.
- FG_f contained the remaining 15 sites from the sandy plains that dominated the Survey Area (SS TeTsc AacAancAi ChCflCoz), as well as a single site (MGW-17) from the floodplains adjacent to Pardoo Creek (FP Te Ev ChfErbErx). This group was characterised by the hummock grass *Triodia epactia.*

On a practical mapping level, the three plains sites dominated by *Triodia schinzii* (FG_e) were considered more appropriately mapped together with sites from the larger group FG_f, which was dominated by *Triodia epactia,* as part of the vegetation association SS TeTsc AacAancAi ChCflCoz. *Triodia schinzii* occurred in patches throughout this mosaic unit; it was sometimes dominant, sometimes absent, and sometimes present as a non-dominant species.

Additionally, site MGW-17 from FG_f was mapped with the sites from FG_c as the vegetation type FP Te Ev ChfErbErx. The moderate *Triodia epactia* cover at this site and the lack of *Chrysopogon fallax* appeared to be the main drivers separating MGW-17 from the other sites in this vegetation type; the presence of *Eragrostis xerophila* at 2% cover was strongly associated with FP Te Ev ChfErbErx, and the site was visually similar to the other sites within this vegetation type. This site was likely positioned in an interzone between the floodplain and sandy plain vegetation types.

Table 5.2: Floristic groupings at 35% similarity and the top indicator species for each.

Floristic Group	Average Similarity	Top Species Contributing to Similarity (Cumulative Similarity)	Vegetation Association
FGa	47.8%	*Eragrostis xerophila, Dichanthium sericeum* subsp. *humilius, Eriachne benthamii, Eriachne glauca* var. *glauca, Ipomoea coptica, Neptunia scutata* (79.4%).	GP ErxErbErgg DishErte (all sites)
FGb	70.1%	*Eulalia aurea, Chrysopogon fallax, Eucalyptus victrix, Eriachne benthamii, Cyperus vaginatus* (72.6%).	ME Ev AsyAcoAthe EuaErbChf Cyv (all sites)
FGc	47.8%	*Chrysopogon fallax, Triodia epactia, Eragrostis xerophila, Eucalyptus victrix, Ptilotus murrayi* (60.7%).	FP Te Ev ChfErbErx (MGW-01, MGW-03)
FGd	64.1%	*Triodia wiseana, Crotalaria medicaginea* var. *neglecta, Dolichocarpa crouchiana, Eriachne pulchella, Euphorbia clementii* (91.9%).	SP Tw AacAi (all sites)
FGe	48.5%	*Triodia schinzii, Acacia ancistrocarpa, Acacia inaequilatera, Aristida holathera* var. *holathera, Bonamia pannosa* (62.8%).	SS TeTsc AacAancAi ChCflCoz (MGW-08, MGW-10, MGW-11)
FGf	38.8%	*Triodia epactia, Bulbostylis barbata, Corymbia hamersleyana, Trigastrotheca molluginea, Bonamia pannosa* (55.8%).	SS TeTsc AacAancAi ChCflCoz (all other sites) FP Te Ev ChfErbErx (MGW-17)

5.1.6 Vegetation of Significance

No TECs or PECs were recorded in the Survey Area, and none are expected to occur based on their known distribution and species composition.

Riparian areas are also typically considered to be of elevated significance. The Survey Area contained one riparian unit, ME Ev AsyAcoAthe EuaErbChf Cyv, within a medium drainage line (Pardoo Creek). This may represent a potential Groundwater Dependent Ecosystem (GDE).

No other vegetation present in the Survey Area was considered to be of elevated local or regional significance. It should be noted that all vegetation associations aside from the gilgai clay plain grassland unit GP ErxErbErgg DishErte yielded records of significant flora (see Section 5.2.5 and Figure 5.1).

5.1.7 Vegetation Condition

The condition of the vegetation in the Survey Area is summarised in Table 5.3 and shown in Figure 5.2.

Of the remnant native vegetation present, vegetation condition ranged from 'Excellent' to 'Very Good' (Figure 5.2; Plate 5.7 and Plate 5.8), with disturbance observed in the form of weed invasion, low level impacts from cattle, and previous clearing or ground disturbance. The minor tracks and rehabilitated mine slope were considered 'Completely Degraded'.

Table 5.3: Extent of vegetation condition categories in the Survey Area.

Condition	Extent in Survey Area		Notes
	Area (ha)	Proportion (%)	
Excellent	17.7	1.9	No disturbance noted.
Very Good	929.2	97.6	Minor (scattered) weeds present or signs of cattle within otherwise intact vegetation. Some areas had been burnt recently but vegetation was recovering well post-fire.
Good	0.0	0.0	-
Poor	0.0	0.0	-
Degraded	0.0	0.0	-
Completely Degraded	4.8	0.5	Minor tracks and an area of rehabilitated mine slope. Devoid or almost devoid of native vegetation.
Total	**951.7**	**100.0**	

Plate 5.7: Vegetation rated as 'Excellent' (site MGW-11).

Plate 5.8: Vegetation rated as 'Very Good' due to the presence of weeds (site MGW-12).

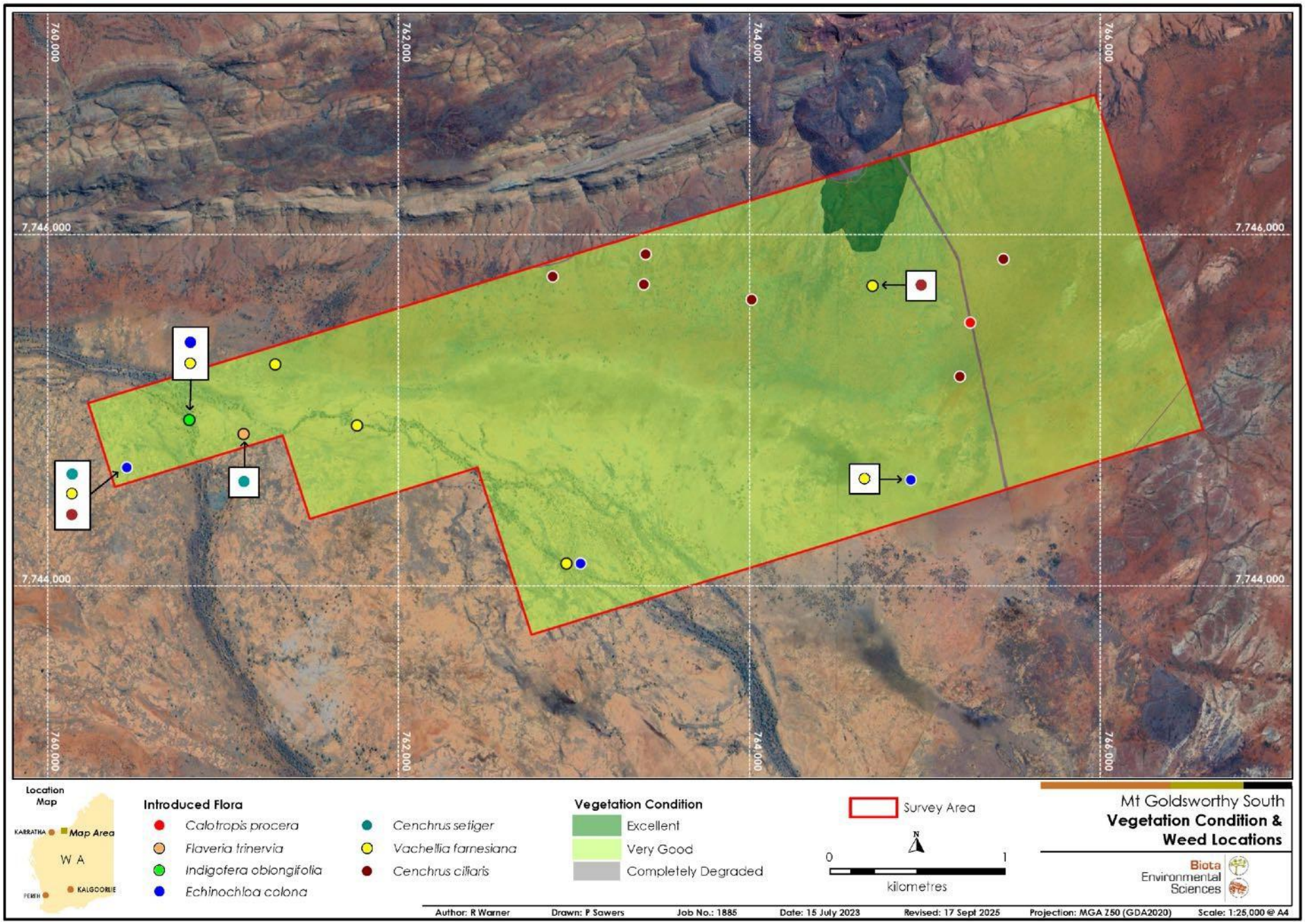

Figure 5.2: **Vegetation condition mapping and locations of introduced flora within the Survey Area.**

5.2 Flora

5.2.1 Overview

A total of 238 native vascular flora taxa from 105 genera and 42 families were recorded during the survey: 26 (10.9%) of these taxa could not be confirmed to the lowest possible level in the current taxonomic framework, mainly due to insueicient material, and some of these may represent species that were already listed (e.g. *Neptunia ? scutata*). Three additional species were recorded from the three quadrats sampled in the Survey Area by Pilbara Flora (2009). Seven introduced flora species were also recorded during the current survey (see Section 5.2.6). A full vascular flora species list is provided in Appendix 8.

The dominant native families and genera recorded from the Survey Area to date are presented in Table 5.4. These families and genera are typically well represented in species lists from this region.

Table 5.4: Dominant native families and genera recorded from the Survey Area.

Family	No. Native Species	Genus	No. Native Species
Fabaceae	47	*Acacia*	13
Poaceae	42	*Bonamia*	8
Malvaceae	19	*Ptilotus*	8
Convolvulaceae	15	*Eragrostis*	7

5.2.2 Sampling Adequacy

The species accumulation curve generated from the quadrat and relevé survey data was approaching a plateau, indicating that the sampling of the Survey Area was thorough (Figure 5.3). The two estimates of species richness (ICE and Chao 2) suggest the actual number of species present in the sampled area was between 284 and 291, indicating that 82-84% of the total flora (native and introduced) was recorded within quadrats and relevés during sampling of the Survey Area (see Table 5.5). This proportion is higher than those reported in other similar surveys in the Pilbara region (e.g. 70% (Biota 2024b)), likely a reflection of the optimal on-ground conditions during the current survey.

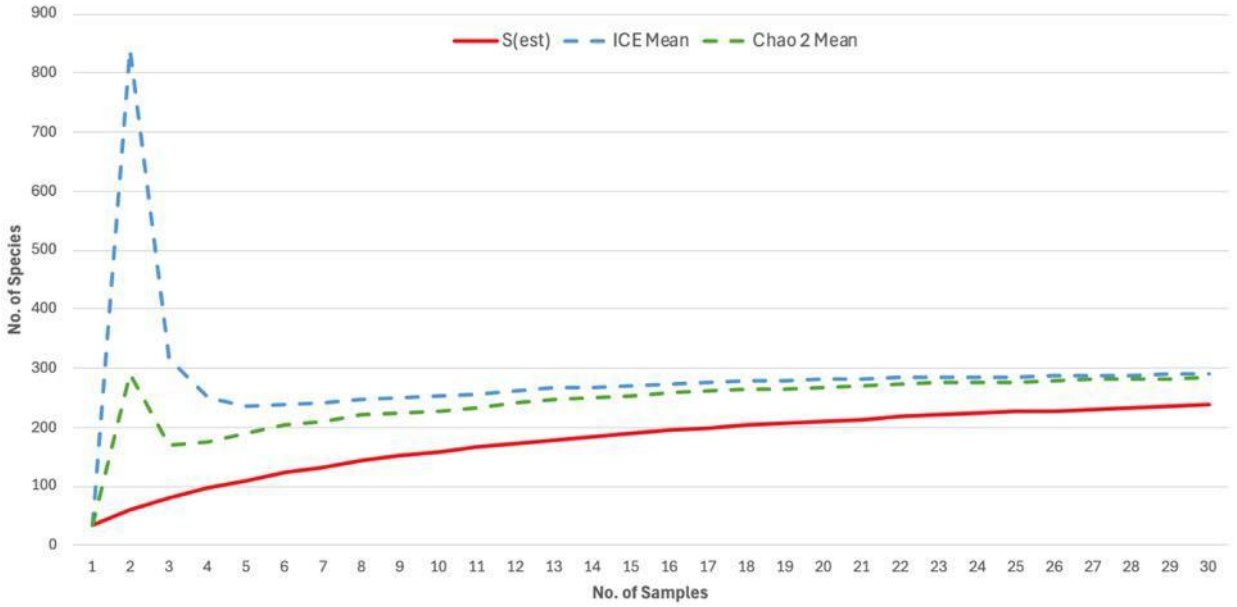

Figure 5.3: Randomised species accumulation curves for sites sampled in the Survey Area.

Table 5.5: Recorded species richness compared with predicted species richness using incidence-based estimators (without opportunistic collections).

Parameter		Number of Species (Native and Introduced)	Percent of Estimated Richness Recorded
Number of species recorded (from quadrats and relevés only)		238	
Estimated number of species	Chao 2 Mean	284	84%
	ICE Mean	291	82%

5.2.3 Unresolved Taxa

The majority (approximately 89.1%) of the recorded flora taxa were able to be identified to the lowest level possible within the current taxonomic framework. The remainder comprised mainly specimens with insueicient or sterile material, with one species (*Eriachne pulchella*) not adequately distinguished to variety level by the current taxonomic keys.

Two unresolved taxa may represent significant species:

- ***Josephinia* sp. indet.**
  One individual of *Josephina* sp. indet. was recorded from site MGW-02, within Pardoo Creek in the western section of the Survey Area. This specimen was unable to be determined to species level due to inadequate material. The common species *Josephinia eugeniae* is known from the locality and the collection is considered most likely to be this species, however it may potentially represent the Priority 1 species *Josephinia* sp. Woodstock (A.A. Mitchell PRP 989). This shrub grows to 0.35 m tall, and has been recorded from red-brown clay loam on drainage lines and plains. It is known in WA from seven records from as far south as Lyndon to as far north as Marble Bar (WA Herbarium 2025). While it has not been recorded from the locality of the Survey Area to date, this genus is relatively poorly collected, and the distribution of individual taxa is poorly resolved.
- ***Tribulopis* sp. (*marliesiae/angustifolia*)**
  One specimen of *Tribulopis* sp. (*marliesiae/angustifolia*) was collected from sandy plain habitat at site MGW-12 in the northern central section of the Survey Area. This specimen was unable to be determined to species level due to inadequate material. It may represent the Priority 3 species *Tribulopis marliesiae,* which is a spreading herb that grows to 50 cm and is known from pindan plains. The nine vouchered records of *T. marliesiae* at the WA Herbarium span approximately 350 km from east of Broome towards the northwestern Great Sandy Desert; while the closest known location of *T. marliesiae* is 84 km southeast of the Survey Area, this slender species is poorly collected and its distribution is not fully described. The collection may, however, represent the morphologically similar but more common species *Tribulopis angustifolia*, which is also known from the locality.

5.2.4 Species Richness

Species richness typically shows a positive relationship with various factors, including the size of the Survey Area, the diversity of habitats present, the amount of rainfall received in the locality, and the survey eeort expended. The total number of native species recorded by the current study is shown in Figure 5.4. Whilst the Survey Area was smallest in size compared to the other four surveys shown, it exhibited the second highest species richness. This was, in part, due to the optimal conditions at the time of the survey, few introduced species (and

none that were dominant), and the presence of habitats known to support diverse communities (i.e. a medium drainage line and gilgai plains).

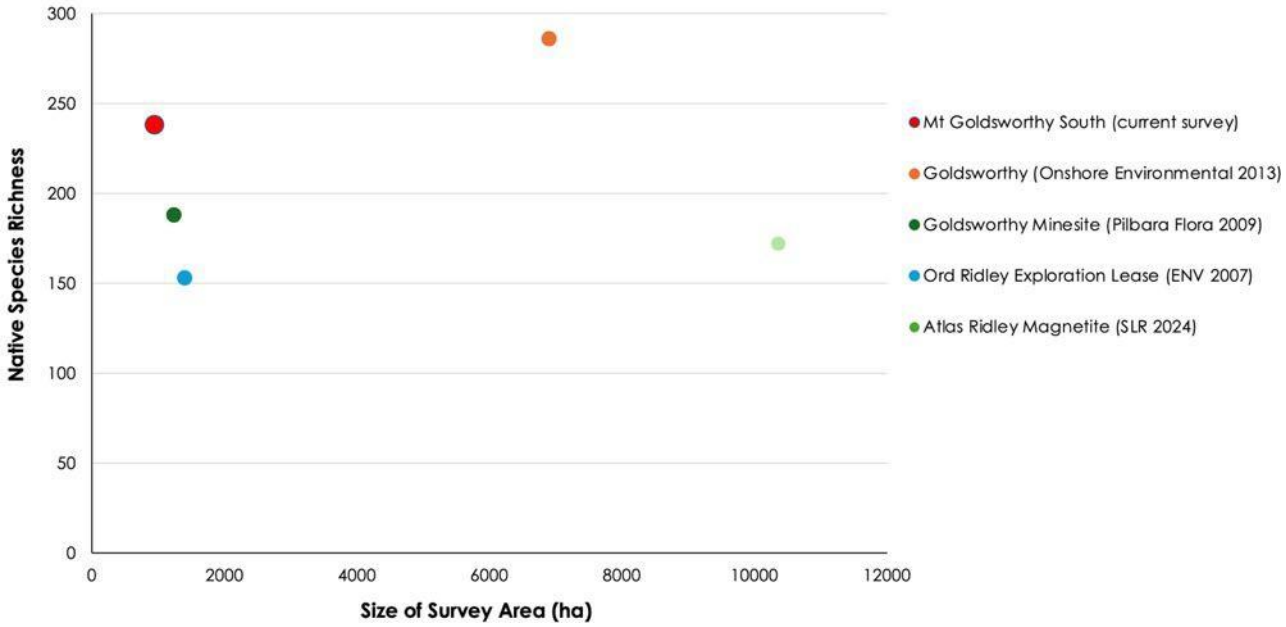

Figure 5.4: Species richness for the current Survey Area, compared to other surveys in the locality.

5.2.5 Significant Flora

No Threatened flora species have been previously recorded in the Survey Area and none were recorded during the current survey or considered likely to occur. Only five Threatened species are currently listed for the Pilbara; all of these have quite restricted distributions that do not extend to the locality of the Survey Area, and/or are strongly associated with habitats that do not occur in the Survey Area.

A total of five Priority flora were recorded during the current survey, all of which are Priority 3 species. These are briefly discussed below and their locations in the Survey Area are provided in Figure 5.1. Specimens of each taxon were confirmed by Mike Hislop of the WA Herbarium.

- ***Bonamia oblongifolia*** **Priority 3**

This small perennial herb (Plate 5.9) has blue flowers and is found on sandy or gravelly soils, with all existing records from the Dampierland bioregion. The single record of one individual from the current survey represents a range extension to the southwest based on specimens vouchered with the WA Herbarium, but is located between records obtained recently by Biota (2024a) that are yet to be vouchered. This species was recorded at site MGW-18 in sandy plain habitat in the western section of the Survey Area.

Plate 5.9: ***Bonamia oblongifolia*** **(P3).**

- ***Euphorbia clementii*** **Priority 3**

This erect annual herb (Plate 5.10) grows to 0.6 m tall and is found on gravelly hillsides and stony ground. Most of the 31 vouchered records of this species at the WA Herbarium are from an area between Port Hedland and Meentheena Station (WA Herbarium 2025). *Euphorbia clementii* was recorded at eight sites and at one opportunistic location in the eastern section of the Survey Area, with all records being scattered individuals from sandy plain and stony plain habitat (covers of 0.1%). This species was previously recorded at one location in the Survey Area by Pilbara Flora (2009).

Plate 5.10: ***Euphorbia clementii*** **(P3).**

- ***Euphorbia inappendiculata*** **var.** ***inappendiculata*** **Priority 3**

This herb (Plate 5.11) grows to 10 cm tall and is typically found on plains, gentle slopes and drainages. It is uncommon but widespread throughout the Pilbara, with 17 vouchered records at the WA Herbarium (WA Herbarium 2025). Single individuals of this species were recorded twice from floodplain habitat at sites MGW-01 and MGW-03 in the western section of the Survey Area.

Plate 5.11: ***Euphorbia inappendiculata* var. *inappendiculata* (P3).**

- ***Euphorbia inappendiculata* var. *queenslandica*** **Priority 3**

This herb (Plate 5.12) grows to 10 cm tall and is found on clay plains and along narrow to broad drainages. There are 17 vouchered records at WA; the known distribution in WA is mostly confined to an area spanning approximately 171 km around Karijini National Park (WA Herbarium 2025), however the species is also known from several other Australian states.

One individual of this species was recorded opportunistically from the southeastern section of the Survey Area from sandy plain habitat, approximately 95 m north of site MGW-45. This record represents a range extension some 230 km northeast towards the Pilbara coast.

Plate 5.12: ***Euphorbia inappendiculata* var. *queenslandica* (P3).**

- ***Uvedalia clementii*** **Priority 3**

This small annual herb (Plate 5.13) grows to 10 cm tall and has small purple and white flowers. There are 10 vouchered records at the WA Herbarium (WA Herbarium 2025); the known distribution of this species is mostly confined to an area around Newman, with an outlying record in Barlee Range Nature Reserve and another south of Roebourne. The current collection represents a range extension to the northeast some 250 km based on this distribution. *Uvedalia clementii* was recorded from four sites in the western section of the Survey Area, all scattered individuals associated with drainage line and floodplain habitat.

Plate 5.13: ***Uvedalia clementii*** **(P3).**

Based on the level of on-ground survey eeort and the vegetation associations mapped for the Survey Area, all remaining significant flora identified as having the potential to occur in the Survey Area from the desktop study were ranked as 'unlikely to occur' following the survey (see Appendix 3).

5.2.6 Introduced Flora

Seven species of introduced flora (weeds) were recorded from the Survey Area (Table 5.6, Figure 5.2 and Appendix 9). None of these species are listed as WONS, however **Calotropis procera* is a Declared Pest for the whole of WA under the BAM Act. One individual of this species was recorded along a track in the eastern section of the Survey Area (765260 mE, 7745505 mN; Plate 5.14; Figure 5.2).

The DBCA designates a Weed Species Ranking for species in each major region of WA through the Weed Prioritisation Process (WPP) (see Department of Parks and Wildlife 2013). This takes into account the potential distribution, current distribution, ecological impact, invasiveness and feasibility of control to derive a broad qualitative weed species ranking, the aim of which is to guide specific management actions. Based on the most recent rankings for the Pilbara (DBCA 2023b), **Calotropis procera* is listed as a Priority alert weed, requiring DBCA to be notified if the species is found on their managed land; this indicates the seriousness with which this species is viewed. Mimosa Bush, Bueel Grass, Birdwood Grass and Barnyard Grass were all ranked as High for ecological impact and Rapid for invasiveness, indicating that they are considered to be serious environmental weeds for the region (Table 5.6). No WPP data are available for the remaining two species, **Flaveria trinervia* and **Indigofera oblongifolia.*

Plate 5.14: *_Calotropis procera_ in the Survey Area

Table 5.6: Summary of introduced flora species recorded in the Survey Area, including WPP rankings for the Pilbara region.

Family	Species (Common Name)	Description	DBCA Pilbara Weed Species Rankings		Distribution in the Survey Area
			Impact	Invasiveness	
Apocynaceae	**Calotropis procera* (Calotrope)	Perennial shrub or small tree growing up to 4 m tall, which is native to Asia and sub-tropical parts of southeast Asia. It can form dense thickets on alluvial floodplains and overgrazed pastures in northern Australia (ALA 2025).	Not ranked; but listed as a "Priority alert weed" if found on DBCA estate.		One individual was recorded once opportunistically from sandy plain habitat along the access track in the eastern section of the Survey Area.
Asteraceae	**Flaveria trinervia* (Speedy Weed)	An annual daisy growing to 40 cm tall. The inflorescence consists of a large dense cluster of yellowish flower heads. This species is widespread through the Pilbara and Kimberley and occurs in a variety of habitats, including drainages and disturbed areas (Hussey et al. 2007).	-	-	One individual was recorded once from MGW-03 in floodplain habitat in the western section of the Survey Area.
Fabaceae	**Indigofera oblongifolia*	An erect spreading shrub to 2 m tall with pink and yellow flowers. It is often recorded in coastal areas and or roadsides. It prefers brown sandy clay, white clay over limestone and alluvial soils. Known from coastal locations in WA from Karratha to Broome (WA Herbarium 2025).	-	-	One individual was recorded once from MGW-02 in the moderate drainage line in the western section of the Survey Area.
	**Vachellia farnesiana* (Mimosa Bush)	Spreading, thorny shrub to 4 m tall, with dark grey bark, pinnate leaves, and yellow flowers in winter. Widespread from the Kimberley to near Perth, typically occurring along drainage systems and in adjacent low-lying areas (WA Herbarium 2025).	H	R	Seven records were made in the Survey Area, three from the moderate drainage line (MGW-02, MGW-16 and MGW-19; eight, 11 and 20 individuals, respectively), two in floodplain habitat (MGW-01 and MGW-17; two and one individuals, respectively), and one each within gilgai plain (MGW-06; one individual) and sandy plain habitats (MGW-22; one individual).

Family	Species (Common Name)	Description	DBCA Pilbara Weed Species Rankings		Distribution in the Survey Area
			Impact	Invasiveness	
Poaceae	**Cenchrus ciliaris* (BuUel Grass)	A perennial tussock grass growing to 1 m tall and flowering for most of the year, which was introduced by pastoralists as a fodder species and is now widespread through WA. This species has demonstrated allelopathic capacities, whereby it releases chemicals that inhibit the growth of other plants (Cheam 1984a, 1984b, Hussain et al. 2010), and it competes aggressively and eUectively with native flora species. Commonly found along drainage lines, floodplains, in sandy coastal areas and disturbed sites, where it can form dense tussock grasslands. Reproduces by seed and short rhizomes and thought to be dispersed primarily by wind and water, but can also be spread through the movement of mammals, birds and vehicles.	H	R	Eight records were made in the Survey Area; seven were from sandy plain habitat [MGW-05 (0.1%), MGW-08 (0.25%), MGW-12 (3%), MGW-13 0.1%), MGW-20 (0.5%), MGW-22 (1.5%) and MGW-R-02 (0.1%)] and one was from floodplain habitat in the western section of the Survey Area (MGW-01; 0.1%).
	**Cenchrus setiger* (Birdwood Grass)	An erect tussocky perennial grass, which grows in the same habitats as BuUel Grass but is usually less common in the Pilbara. Similarly introduced as a fodder species in pastoral areas and has since become a common weed in watercourses from Carnarvon to the Kimberley (WA Herbarium 2025).	H	R	Two records of individuals were made at MGW-01 and MGW-03, both floodplain sites in the western section of the Survey Area.
	**Echinochloa colona* (Barnyard Grass)	Tufted annual grass growing to 60 cm, and flowering from February to July. It is a common weed of drainage lines and other damp habitats, particularly in the Pilbara and Kimberley (Hussey et al. 2007). It can occur in moderate densities but does not appear to exclude other native species.	H	R	Four records of single individuals were made at sites MGW-01 (floodplain), MGW-02 (drainage line), MGW-06 (gilgai plain) and opportunistically in drainage line habitat near site MGW-19.

† Ecological Impact Rankings: L=Low; M=Medium; H=High; U=Unknown. Invasiveness rankings: S=Slow; M=Moderate; R=Rapid; U=Unknown.

6.0 Discussion

A single phase detailed and targeted flora and vegetation survey was conducted from March 24th to 29th 2025. The field survey was undertaken at an appropriate timing in the post-wet season, with optimal conditions for the collection of flora.

The majority of the Survey Area (99.5%) consisted of intact native vegetation. Five vegetation associations were mapped within this area:

- Two associations in a medium drainage line and the adjacent floodplain:
  - ME Ev AsyAcoAthe EuaErbChf Cyv: Low Open Woodland of *Eucalyptus victrix* with a High Open Shrubland of *Acacia synchronicia*, *Acacia colei, Atalaya hemiglauca* with a Tussock Grassland of *Eulalia aurea*, *Eriachne benthamii* and *Chrysopogon fallax* and Scattered Sedges of *Cyperus vaginatus* on reddish brown light to medium clay in a moderate creekline.
  - FP Te Ev ChfErbErx: Very Open Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Eucalyptus victrix* with a Very Open Tussock Grassland of *Chrysopogon fallax, Eriachne benthamii* and *Eragrostis xerophila* on reddish brown light to medium clay on floodplains.
- Two associations on sandy and stony plains:
  - SS TeTsc AacAancAi ChCflCoz: Open Hummock Grassland of *Triodia epactia* and *T. schinzii* with an Open Shrubland to High Open Shrubland of *Acacia acradenia, A. ancistrocarpa* and *A. inaequilatera* with Scattered Low Trees of *Corymbia hamersleyana, C. flavescens* and *C. zygophylla* on red sands and sandy loams on sandy and stony plains.
  - SP Tw AacAi: Open Hummock Grassland of *Triodia wiseana* with Scattered Shrubs of *Acacia acradenia* and *A. inaequilatera* on reddish brown sandy loam on stony low rises at the footslopes of medium ranges.
- One association on gilgai plains.
  - GP ErxErbErgg DishErte: Closed Tussock to Tussock Grassland of *Eragrostis xerophila, Eriachne benthamii* and *Eriachne glauca* var. *glauca* with an Open Bunch Grassland of *Dichanthium sericeum* subsp. *humilius* and *Eragrostis tenellula* on yellow to red gilgai clay plains.

Most of the vegetation (97.6%) was in 'Very Good' condition, nearing 'Excellent', with only minor scattered weeds and low-level cattle activity. The stony plain association in the north of the Survey Area was the only unit in 'Excellent' condition (1.9%). The remaining 0.5% of the Survey Area comprised cleared areas (unit OT (C); accounting for 0.4% of the Survey Area) and rehabilitation on mine slopes (unit OT (R); accounting for 0.1% of the Survey Area). Both of these units were rated as 'Completely Degraded'.

No TECs or PECs are known to occur in the Survey Area. Two Priority 3 PECs occur within the wider Study Area, the Eighty Mile Land System and Lake Gregory Land System. Given the lack of suitable habitat in the Survey Area, neither PEC would occur.

The riparian unit ME Ev AsyAcoAthe EuaErbChf Cyv may represent a GDE and was considered to be of elevated local significance. All vegetation associations apart from the gilgai plain unit supported populations of significant flora, all of which were Priority 3 species.

A total of 238 native vascular flora taxa from 105 genera and 42 families were recorded during the survey, and three additional native species were recorded by previous sampling (Pilbara Flora 2009). Analysis indicated that approximately 82-84% of the total flora was recorded during the survey, which likely reflected the optimal sampling conditions, low levels of disturbance, and presence of habitats known to support species diversity (riparian areas and gilgai plains). Further to this, the species richness recorded from the Survey Area was relatively high when compared to other surveys in the locality.

No Threatened flora were recorded during the survey and none would be expected to occur. Five Priority 3 species were recorded from the Survey Area (*Bonamia oblongifolia*, *Euphorbia clementii*, *Euphorbia inappendiculata* var. *inappendiculata*, *Euphorbia inappendiculata* var. *queenslandica* and *Uvedalia clementii*). The two latter species represent reasonable range extensions.

Two unresolved taxa could potentially represent additional Priority species from the Survey Area: *Josephinia* sp. indet. (potentially the Priority 1 *Josephinia* sp. Woodstock (A.A. Mitchell PRP 989)) and *Tribulopis* sp. indet. (potentially the Priority 3 *Tribulopis marliesiae*). While neither taxa is considered particularly likely to represent the Priority species, based on their current known distribution; the material was too poor to confirm these specimens to species level. The post-survey likelihood assessment indicates that no additional significant species are likely to occur in the Survey Area.

Seven introduced flora species (weeds) were also recorded, one of which, **Calotropis procera*, is listed as a Declared Pest for the whole of WA under the BAM Act.

7.0 Glossary

BAM Act	Western Australian *Biosecurity and Agriculture Management Act 2007.*
BC Act	Western Australian *Biodiversity Conservation Act 2016.*
Biota	Biota Environmental Sciences.
DBCA	Department of Biodiversity, Conservation and Attractions.
EIA	Environmental Impact Assessment.
EPA	Environmental Protection Authority of Western Australia.
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
IBRA	Interim Biogeographic Regionalisation for Australia.
Landform	A geomorphological unit that is largely defined by its surface form and location in the Study Area.
PEC	Priority Ecological Community.
sp. (plural: spp.)	Abbreviation of “species”.
Study Area	The 40 km buUer area surrounding the Survey Area.
Survey Area	The area in which the on-ground survey was conducted.
Taxon (plural: taxa)	A taxonomic entity, typically at species level or below.
TEC	Threatened Ecological Community.

8.0 References

ALA (2025). WeedsAustralia - Profiles *Calotropis procera* (Aiton) R.Br. ex W.T.Aiton [WWW Document]. Centre for Invasive Species Solutions, Canberra, . Retrieved from https://profiles.ala.org.au/opus/weeds-australia/profile/Calotropis%20procera.

Aplin, T. E. H. (1979). Chapter 3: The Flora. Pages 53–76 *in* B. J. O'Brien, editor. *Environment and Science*. The University of Western Australia Press.

Barrett, R. L., and M. D. Barrett (2015). Twenty-seven new species of vascular plants from Western Australia. *Nuytsia* 26:21–87.

Beard, J. S. (1975). Vegetation Survey of Western Australia 1:1,000,000 Vegetation Series. Map Sheet 5 - Pilbara. University of Western Australia Press, Western Australia.

BHP (undated). Vegetation and Flora Survey Procedure. Unpublished internal procedure Document no. 0124627, Version 3.0, supplied July 2024, BHP, Perth, Western Australia.

Biota (2024a). Biota Unpublished Data from 2024 Survey. Biota Environmental Sciences, West Perth, Western Australia.

Biota (2024b). Chichester Solar Biological Survey. Unpublished report prepared for Alinta energy Pilbara Holdings Pty Ltd, January 2024, Biota Environmental Sciences, West Perth, WA.

Bureau of Meteorology (2025). Climate Data Online. Bureau of Meteorology, Melbourne, Australia. Retrieved from http://www.bom.gov.au/climate/data/.

Cheam, A. H. (1984a). Allelopathy in bueel grass (*Cenchrus ciliaris* L.) Part II. Site of release and distribution of allelochemical in the soil profile. *Australian Weeds* 3:137–139.

Cheam, A. H. (1984b). Allelopathy in bueel grass (*Cenchrus ciliaris* L.) Part I. Influence of bueel grass association on calotrope (*Calotropis procera* (Ait) W.T.Ait.). *Australian Weeds* 3:133–136.

Christian, C. S., and G. A. Stewart (1953). General Report on Survey of Katherine-Darwin Region, 1946. Australian Land Research Series 1, CSIRO.

Clarke, K., and R. Gorley (2015). Primer v7: User Manual/Tutorial. PRIMER-E Ltd, Plymouth, UK.

Colwell, R. K. (2013). EstimateS: Statistical Estimation of Species Richness and Shared Species from Samples. Version 9 and earlier. User's Guide and application. University of Connecticut, USA. Retrieved from http://purl.oclc.org/estimates.

DAWE (2021). Directory of Important Wetlands in Australia [WWW Document]. Department of Agriculture, Water and the Environment, . Retrieved from http://www.environment.gov.au/topics/water/water-our-environment/wetlands/australian-wetlands-database/directory-important.

DBCA (2023a). Priority Ecological Communities for Western Australia, Version 35. Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 19 June 2023.

DBCA (2023b). Pilbara Weed Impact and Invasiveness Ratings. List of weeds for the Pilbara region, last updated 27-04-2023, Department of Biodiversity, Conservation and Attractions. Retrieved from https://www.dbca.wa.gov.au/management/threat-management/weeds.

DCCEEW (2025a). Australia's bioregions (IBRA) [WWW Document]. Department of Climate Change, Energy, the Environment and Water, . Retrieved from https://www.dcceew.gov.au/environment/land/nrs/science/ibra.

DCCEEW (2025b). Directory of Important Wetlands in Australia - Information sheet: De Grey River - WA065 [WWW Document]. Retrieved from http://www.environment.gov.au/cgi-bin/wetlands/report.pl.

Department of Parks and Wildlife (2013). Weed Prioritisation Process for Department of Parks and Wildlife (formerly DEC) - "An integrated approach to Environmental Weed Management in WA". (As at November 2013). Department of Parks and Wildlife, Western Australia.

DPIRD (2018). Rangeland land system mapping of Western Australia. Digital Dataset, Department of Primary Industries and Regional Development.

DPIRD (2025). Western Australian Organism List (WAOL) Declared Pest Database [WWW Document]. Department of Primary Industries and Regional Development, Agriculture and Food Division, . Retrieved from https://www.agric.wa.gov.au/organisms.

DWER (2021). Environmentally Sensitive Areas declared under the Environmental Protection Act 1986. Department of Water and Environmental Regulation, Perth.

Ecologia (2011). BHP Billiton Iron Ore Rail Operations Biodiversity – Flora Survey Goldsworthy Junction to Yarrie. Report prepared for BHP Billiton Iron Ore Pty Ltd, February 2011, Ecologia Environment, West Perth, Western Australia.

Ecologia (2012). Canning Basin Borefield and Pipeline Single Phase Flora and Vegetation Assessment. Unpublished report for Fortescue Metals Group Ltd, May 2012, Ecologia Environment, West Perth, Western Australia.

ENV (2007). Ord Ridley Exploration Lease Flora and Vegetation Assessment. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, August 2007, ENV Australia Pty Ltd, Western Australia.

EPA (1988). Inland waters of the Pilbara Western Australia (Part I). Technical Series No 10, January 1988. Technical Series, EPA, Perth Western Australia.

EPA (2016a). *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.

EPA (2016b). *Environmental Factor Guideline: Flora and Vegetation*. Environmental Protection Authority, Western Australia.

Focused Vision (2022). Detailed Flora and Vegetation Survey, Pardoo/Ridley. Unpublished report for Atlas Iron Pty Ltd, October 2022, Focused Vision Consulting Pty Ltd, Western Australia.

Government of Western Australia (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. Department of Biodiversity, Conservation and Attractions, Perth, Western Australia.

Halford, D. A., and W. K. Harris (2012). A taxonomic revision of *Euphorbia* section *Anisophyllum* Roeper (Euphorbiaceae) in Australia. *Austrobaileya* 8:441–723.

Hussain, F., B. Ahmad, and I. Ilahi (2010). Allelopathic eeects of *Cenchrus ciliaris* L. and *Bothriochloa pertusa* (L.) A. Camus. *Pakistan Journal of Botany* 42(5):3587–3604.

Hussey, B. M. J., G. J. Keighery, R. D. Cousens, J. Dodd, and S. G. Lloyd (2007). *Western Weeds A guide to the weeds of Western Australia*, 2nd edition. The Plant Protection Society of Western Australia (Inc.), Perth.

Keighery, B. J. (1994). Bushland Plant Survey - A Guide to Plant Community Survey for the Community. Wildflower Society of Western Australia (Inc), Nedlands, Western Australia.

Kendrick, P., and N. McKenzie (2003). Pilbara 1 (PIL1 - Chichester subregion). Pages 547–558 *in* J. E. May and N. L. McKenzie, editors. *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions*. Department of Conservation and Land Management, Western Australia.

Kendrick, P., and F. Stanley (2003). Pilbara 4 (PIL4 - Roebourne synopsis). Pages 581–594 *in* J. E. May and N. L. McKenzie, editors. *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions*. Department of Conservation and Land Management, Western Australia.

McFarlane, D. (Ed.) (2015). *Pilbara Water Resource Assessment: De Grey Canning region. A report to the Government of Western Australia and industry partners from the CSIRO Pilbara Water Resource Assessment*. CSIRO Land and Water, Australia. Retrieved from https://doi.org/10.4225/08/584af1b6bde2f.

Northcote, K. H., G. G. Beckmann, E. Bettenay, H. M. Churchward, D. C. Van Dijk, G. M. Dimmock, G. D. Hubble, R. F. Isbell, W. M. McArthur, G. G. Murtha, K. D. Nicolls, T. R. Paton, C. H. Thompson, A. A. Webb, and M. J. Wright (1960). Atlas of Australian Soils: Sheets 1 to 10 with explanatory data. Series of maps prepared between 1960 and 1968, CSIRO Australia and Melbourne University Press, Melbourne, Victoria.

NVIS Technical Working Group (2017). Australian Vegetation Attribute Manual - National Vegetation Information System, Version 7.0. Department of the Environment and Energy, Canberra.

Onshore Environmental (2013). Flora and Vegetation Survey: Goldsworthy. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, January 2013, Onshore Environmental Consultants Pty Ltd, Western Australia.

Pilbara Flora (2009). Flora and Vegetation Survey of the Goldsworthy Minesite. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, January 2009, Pilbara Flora, Western Australia.

Shepherd, D. P., G. R. Beeston, and A. J. M. Hopkins (2002). Native vegetation in Western Australia: Extent, Type and Status. Technical Report 249, Department of Agriculture and Food, Western Australia, Perth.

SLR Consulting (2024). Atlas Ridley Magnetite Project Connection - Flora and Fauna Survey Technical Report. Published report prepared for Horizon Power, July 2024, SLR Consulting Australia, Subiaco, Western Australia.

Specht, R. L. (1970). Vegetation. Pages 44–67 *in* G. W. Leeper, editor. *The Australian Environment*, 4th edition. CSIRO in association with Melbourne University Press, Melbourne.

Stewart, A. J., I. P. Sweet, R. S. Needham, O. L. Raymond, A. J. Whitaker, S. F. Liu, D. Phillips, A. J. Retter, D. P. Connolly, and G. Stewart (2008). Surface geology of Australia 1:1,000,000 scale, Western Australia [Digital Dataset]. Geoscience Australia, Canberra.

Trudgen, M. E. (2002). A flora, vegetation and floristic survey of the Burrup Peninsula, some adjoining areas and part of the Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland - Volume 1. Unpublished report for the Department of Mineral & Petroleum Resources, M.E. Trudgen and Associates.

van Vreeswyk, A. M. E., K. A. Leighton, A. L. Payne, and P. Hennig (2004). An inventory and condition survey of the Pilbara region, Western Australia. Technical Bulletin 92, Department of Agriculture, Perth, Western Australia.

WA Herbarium (2025). Florabase - the Western Australian Flora [WWW Document]. Department of Biodiversity, Conservation and Attractions, . Retrieved from http://florabase.dbca.wa.gov.au/.

Weeds Australia (2025). Weeds of National Significance [WWW Document]. Centre for Invasive Species Solutions, Canberra, . Retrieved from https://weeds.org.au/weeds-profiles/.

Appendix 1

EPBC Act PMST and NatureMap Database Search Results

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 30-Jun-2025

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	37
Listed Migratory Species:	48

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	79
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	1

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	2
EPBC Act Referrals:	10
Key Ecological Features (Marine):	None
Biologically Important Areas:	3
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Eighty-mile beach	Within 10km of Ramsar site	In buffer area only

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area	In buffer area only
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
REPTILE			
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Liasis olivaceus barroni Pilbara Olive Python [66699]	Vulnerable	Species or species habitat known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only
SHARK			
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Breeding likely to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat likely to occur within area	In buffer area only
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Dugong dugon Dugong [28]		Species or species habitat likely to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Breeding likely to occur within area	In buffer area only
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat likely to occur within area	In buffer area only
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons			
Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Fish			
Bulbonaricus brauni			
Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area	In buffer area only
Campichthys tricarinatus			
Three-keel Pipefish [66192]		Species or species habitat may occur within area	In buffer area only
Choeroichthys brachysoma			
Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area	In buffer area only
Choeroichthys suillus			
Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus janssi			
Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus negrosensis			
Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area	In buffer area only
Festucalex scalaris			
Ladder Pipefish [66216]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris			
Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area	In buffer area only
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area	In buffer area only
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat likely to occur within area	In buffer area only
Reptile			
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area	In buffer area only
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area	In buffer area only
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area	In buffer area only
Aipysurus tenuis Brown-lined Sea Snake, Mjoberg's Sea Snake [1121]		Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area	In buffer area only
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Hydrelaps darwiniensis Port Darwin Sea Snake, Black-ringed Mangrove Sea Snake [1100]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In buffer area only
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area	In buffer area only
Hydrophis macdowelli as Hydrophis mcdowelli MacDowell's Sea Snake, Small-headed Sea Snake, [75601]		Species or species habitat may occur within area	In buffer area only
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area	In buffer area only
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area	In buffer area only
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		Species or species habitat may occur within area	In buffer area only
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In buffer area only
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only

Whales and Other Cetaceans

[Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Australian Marine Parks

[Resource Information]

Park Name	Zone & IUCN Categories	Buffer Status
Eighty Mile Beach	Multiple Use Zone (IUCN VI)	In buffer area only

Habitat Critical to the Survival of Marine Turtles			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
All year (Jun - Aug)			
Natator depressus			
Flatback Turtle [59257]	Nesting	Known to occur	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Eighty Mile Beach	Marine Park	WA	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
De Grey River	WA	In buffer area only
Eighty Mile Beach System	WA	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Miralga Creek Project, Pilbara region, WA	2019/8601		Post-Approval	In buffer area only
Panoram Copper-Zinc mine	2007/3310		Completed	In buffer area only
Ridley Magnetite Project	2023/09477		Referral Decision	In buffer area only
Controlled action				
Great Northern Pipeline - 630 km buried gas pipeline	2009/5257	Controlled Action	Completed	In buffer area only
North Star Magnetite Project	2012/6689	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Bulgarene Borefield	2006/2507	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Pardoo Direct Shipping Ore (DSO) Project	2007/3539	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Telfer Gold Mine Project - Mine and Borefield Extensions and Upgrade of Storage	2002/787	Not Controlled Action	Completed	In buffer area only
Telfer Gold Mine Project - Power Supply and Infrastructure Corridor	2002/786	Not Controlled Action	Completed	In feature area

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Marine Turtles			
Natator depressus			
Flatback Turtle [59257]	Internesting buffer	Known to occur	In buffer area only
Seabirds			
Fregata ariel			
Lesser Frigatebird [1012]	Breeding	Known to occur	In feature area
Whales			
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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NatureMap Search Results (Significant Taxa only)

Taxon	Conservation Status	Number of Records
Euploca parviantra	P1	1
Euphorbia clementii	P3	3
Euphorbia inappendiculata var. *inappendiculata*	P3	1
Heliotropium murinum	P3	3
Rothia indica subsp. *australis*	P3	6
Bulbostylis burbidgeae	P4	1
Ptilotus mollis	P4	1

Appendix 2

Framework for Conservation Significance Ranking of Communities and Species in WA

CONSERVATION CATEGORY DEFINITIONS

for Western Australian Ecological Communities

GENERAL DEFINITIONS

An **ecological community** is a naturally occurring assemblage of organisms that occurs in a particular habitat, as defined in the *Biodiversity Conservation Act 2016* (BC Act). Ecological communities may comprise various life forms including plants, animals and microorganisms.

Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) means an ecological community that is listed under section 27(1) of the BC Act as a critically endangered, endangered or vulnerable ecological community, or is a rediscovered ecological community to be regarded as a threatened ecological community under section 33 of the BC Act.

An **assemblage** is a defined group of biological entities.

Habitat, as defined in the BC Act, means the biophysical medium or media —

a) occupied (continuously, periodically or occasionally) by an organism or group of organisms, or
b) once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind have the potential to be reintroduced.

An **occurrence** is a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres with, for example: a different ecological community, a sealed road, a building, a water body (for terrestrial communities), or a terrestrial body (for aquatic communities). There is no minimum size of an occurrence of a threatened or priority ecological community. By ensuring that every discrete occurrence is recognised and recorded, future changes in status can be readily monitored.

Adequately surveyed is defined as an ecological community that has been searched for thoroughly in most likely habitats, by relevant experts.

Community structure is defined as the spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage. For example, the vegetation structure (e.g., *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs) or the trophic structure in a faunal assemblage (e.g., dominance by feeders on detritus as distinct from feeders on live plants).

To **modify** an occurrence of an ecological community, as defined in section 44 of the BC Act, means to take action that results in —

(a) the modification of the occurrence of the threatened ecological community to such an extent that the occurrence is unlikely to recover —
    (i) its species composition or structure; or
    (ii) its species composition and structure; or
(b) the destruction of the occurrence of the threatened ecological community.

Destruction of an occurrence of an ecological community means modification such that reestablishment of ecological processes, species composition or community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention.

Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Refer to the document Guidance note – Modification of an occurrence of a threatened ecological community for more information on what constitutes modification and how to determine whether an action is likely to modify an occurrence of a threatened ecological community.

Threatening process means a process that threatens, or may threaten, the survival, abundance or evolutionary development of a native species or ecological community, as defined under the BC Act. Examples of some of the continuing threatening processes in Western Australia include: vegetation clearance; competition and land degradation by introduced fauna; dieback caused by the root-rot fungus (*Phytophthora cinnamomi*); competition and displacement of native plants by introduced flora; hydrological changes (declining groundwater levels); drying climate, fire regimes that cause declines in biodiversity; direct human exploitation and disturbance of ecological communities.

Restoration is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

Rehabilitation is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

LISTED ECOLOGICAL COMMUNITIES

Assessment of the conservation status of ecological communities is carried out in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline Number 1 and Ministerial Guideline Number 4 that adopt the use of the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Categories and Criteria.

CO Collapsed ecological communities

An ecological community listed by order of the Minister as collapsed under section 31(1) of the BC Act. As determined by criteria set out in section 32 of the BC Act, an ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time —

(a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or
(b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover —
    (i) its species composition or structure; or
    (ii) its species composition and structure.

CR Critically endangered ecological communities

A threatened ecological community listed in the category of critically endangered under section 27(1)(a) of the BC Act, as determined by criteria set out in section 28 of the BC Act and the ministerial guidelines. A critically endangered ecological community faces an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines.

Examples of use:

- ‘Assemblages of the organic springs and mound springs of the Mandora Marsh area’ is listed as a critically endangered threatened ecological community under the *Biodiversity Conservation Act 2016.*
- ‘Assemblages of the organic springs and mound springs of the Mandora Marsh area’ is listed as critically endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table – column heading: BC Act; row text: CR.

EN Endangered ecological communities

A threatened ecological community listed in the category of endangered ecological community under section 27(1)(b) of the BC Act, as determined by criteria set out in section 29 of the BC Act and the ministerial guidelines. A threatened ecological community faces a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines.

Examples of use:

- ‘Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson *et al*. (1994))’ is listed as an endangered threatened ecological community under the *Biodiversity Conservation Act 2016.*
- ‘Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))’ is listed as endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table – column heading: BC Act; row text: EN.

VU Vulnerable ecological communities

A threatened ecological community listed in the category of vulnerable ecological community under section 27(1)(c) of the BC Act, as determined by criteria set out in section 30 of the BC Act and the ministerial guidelines. A vulnerable ecological community faces a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines.

Examples of use:

- '*Calothamnus graniticus* subsp. *graniticus* heaths on south west coastal granites' is listed as a vulnerable threatened ecological community under the *Biodiversity Conservation Act 2016.*
- '*Calothamnus graniticus* subsp. *graniticus* heaths on south west coastal granites' is listed as vulnerable under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table – column heading: BC Act; row text: VU.

PRIORITY ECOLOGICAL COMMUNITIES

Priority is not a listing category under the BC Act. The Priority Ecological Communities list is maintained by the department and is published on the department's website.

All fauna and flora that may be present in an ecological community are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when these species occur in an ecological community that is not listed as threatened, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Possible threatened ecological communities that do not meet survey criteria or are not adequately defined to enable listing are added to the department's Priority Ecological Communities for Western Australia list under priority 1, 2 or 3. Ecological communities that are adequately known and not threatened but rare, near threatened, or have recently been removed from the threatened list are placed in priority 4. Conservation dependent ecological communities are placed in priority 5.

P1 Priority 1: Poorly known ecological communities – very few occurrences, very restricted distribution

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g., within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Examples of use:

- 'Banded Ironstone Hills with *Dryandra arborea*' is listed as a Priority 1 ecological community by the Department of Biodiversity, Conservation and Attractions.
- 'Banded Ironstone Hills with *Dryandra arborea*' is listed as Priority 1 on the DBCA Priority Ecological Communities List.
- Listing reference in a table – column heading: DBCA; row text: P1.

P2 Priority 2: Poorly known ecological communities – few occurrences, restricted distribution

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Examples of use:

- 'Aquatic invertebrate communities of peat swamps' is listed as a Priority 2 ecological community by the Department of Biodiversity, Conservation and Attractions.
- 'Aquatic invertebrate communities of peat swamps' is listed as Priority 2 on the DBCA Priority Ecological Communities List.
- Listing reference in a table – column heading: DBCA; row text: P2.

P3 Priority 3: Poorly known ecological communities – inadequately surveyed or not well defined

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them. This category includes three sub-categories:

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation.

(ii) Communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years).

(iii) Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change, etc.

Examples of use:

- 'Assemblages of gypsum dunes of the central and southern wheatbelt' is listed as a Priority 3(iii) ecological community by the Department of Biodiversity, Conservation and Attractions.
- 'Assemblages of gypsum dunes of the central and southern wheatbelt' is listed as Priority 3(iii) on the DBCA Priority Ecological Communities List.
- Listing reference in a table – column heading: DBCA; row text: P3(iii).

P4 Priority 4: Adequately known ecological communities – rare, near threatened, or recently removed from the threatened list

Ecological communities that are adequately known and either rare but not threatened, near threatened, or have recently been removed from the threatened list. These communities require regular monitoring.

(i) Rare: ecological communities known from few occurrences 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 communities are usually represented on conservation lands.

(ii) Near threatened: ecological communities that are considered to have been adequately surveyed and that do not qualify as conservation dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Examples of use:

- 'Nimalaica (Nimalarragun) claypan and associated wetland assemblages' is listed as a Priority 4(ii) ecological community by the Department of Biodiversity, Conservation and Attractions.
- 'Nimalaica (Nimalarragun) claypan and associated wetland assemblages' is listed as Priority 4(ii) on the DBCA Priority Ecological Communities List.
- Listing reference in a table: column heading: DBCA, row text: P4(ii).

P5 Priority 5: Conservation dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

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.

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 under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

Examples of use:

- The western ringtail possum (*Pseudocheirus occidentalis*) is listed as a critically endangered threatened species under the *Biodiversity Conservation Act 2016.*
- Western ringtail possum is listed as critically endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: CR.

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.

Examples of use:

- *Caladenia hopperiana* is listed as an endangered threatened species under the *Biodiversity Conservation Act 2016.*
- *Caladenia hopperiana* is listed as endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: EN.

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 under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Examples of use:

- The forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) is listed as a vulnerable threatened species under the *Biodiversity Conservation Act 2016.*
- Forest red-tailed black cockatoo is listed as vulnerable under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: VU.

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).

Examples of use:

- *Acacia kingiana* is listed as an extinct species under the *Biodiversity Conservation Act 2016.*
- *Acacia kingiana* is listed as extinct under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: EX.

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 25 of the BC Act).

Currently there are no fauna or flora species listed as extinct in the wild.

SP 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).

Migratory species include birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA)[4], China (CAMBA)[5] or 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.

Examples of use:

- The wedge-tailed shearwater (*Ardenna pacifica*) is listed as a specially protected migratory species under the *Biodiversity Conservation Act 2016.*
- Wedge-tailed shearwater is listed as migratory under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: MI.

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.

Examples of use:

- The wambenger, south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) is listed as a specially protected species of special conservation interest under the *Biodiversity Conservation Act 2016.*
- Wambenger, south-western brush-tailed phascogale, is listed as conservation dependent under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: CD.

OS **Species otherwise in need of special protection (other specially protected)**

Species 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.

Examples of use:

- The dugong (*Dugong dugon*) is listed as a specially protected species otherwise in need of special protection under the *Biodiversity Conservation Act 2016.*
- Dugon is listed as other specially protected fauna under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: OS.

P **Priority species**

Priority is not a listing category under the BC Act. The Priority Flora and Fauna lists are maintained by the department and are published on the department's website.

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 for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

Examples of use:

- *Borya stenophylla* is listed as a Priority 1 species by the Department of Biodiversity, Conservation and Attractions.
- *Borya stenophylla* is listed as Priority 1 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P1.

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.

Examples of use:

- *Caladenia nivalis* is listed as a Priority 2 species by the Department of Biodiversity, Conservation and Attractions.
- *Caladenia nivalis* is listed as Priority 2 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P2.

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.

Examples of use:

- *Acacia nitidula* is listed as a Priority 3 species by the Department of Biodiversity, Conservation and Attractions.
- *Acacia nitidula* is listed as Priority 3 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P3.

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 a conservation dependent specially protected species.

(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

(d) Other species in need of monitoring.

Examples of use:

- *Banksia aculeata* is listed as a Priority 4 species by the Department of Biodiversity, Conservation and Attractions.
- *Banksia aculeata* is listed as Priority 4 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P4.

[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.

Appendix 3

Likelihood of Occurrence Assessment for Significant Flora

* All habit and habitat information taken from Florabase (http://florabase.dbca.wa.gov.au) unless referenced otherwise.
TPFL = DBCA Threatened and Priority Flora database; WAH = WA Herbarium database.
^ ALA location data for significant flora are generalised to the nearest 10 km, so nearest record distances were not calculated.
NB: records in "*proximity*" are within 20 km of the Survey Area; records from the "*locality*" are within 40 km of the Survey Area.

Taxon	Habit *	Habitat *	Database Searches					Previous Survey Occurrence	Likelihood of Occurrence	
			TPFL	WAH	EPBC PMST	NatureMap	ALA		**Initial Ranking Based on Desktop Study** (NR = nearest record).	**Final Ranking Including Results of Survey**
Priority 1										
Corchorus sp. Yarrie (J. Bull & D. Roberts CAL 01.05)	Herb or shrub to 1.6 m tall, with hairy stems, cylindrical fruit and yellow flowers.	Gullies, drainage lines, on hilltops and slopes on skeletal ironstone soils.		•		•	•		**May occur**: suitable habitat may be present in the southwestern section of the Survey Area, however species has not been recorded as far north as the Survey Area to date; one historical record (dated 1941) from the Study Area, located 28 km south of the Survey Area (WA Herbarium 2025).	**Unlikely to occur**: potentially suitable habitat present (i.e. Ev AsyAcoAthe EuaErbChf Cyv) but species was not recorded during the survey.
Euploca parviantrum	Small, spindly annual herb with white flowers in June.	Spinifex plains.		•		•			**May occur**: suitable habitat may be present in the Survey Area; one record from the Study Area, but not in proximity (NR=38 km northwest) (WA Herbarium 2025).	**Unlikely to occur**: suitable habitat was present but species was not recorded during the survey.
Triodia degreyensis	Soft hummock grass to 1.0 m tall, flowering between February and March.	Rocky or gravelly hills.		•			•		**May occur**: suitable habitat may be present in northern sections of the Survey Area; three records from the Study Area, none in proximity (NR=34 km west) (WA Herbarium 2025).	**Unlikely to occur**: while suitable habitat was present (e.g. vegetation Tw AacAi), this species was not recorded during the survey.
Priority 3										
Bonamia oblongifolia	Perennial herb to 0.2 m tall with blue flowers in February.	Sandy or gravelly soils.		•				•	**May occur**: suitable habitat may be present in the Survey Area. No previous records within the Study Area, but recorded both to the east and west; NR=71 km northeast (Biota 2024a).	**Recorded**: one individual was recorded during the 2025 survey, representing a range extension when compared to specimens vouchered at the WA Herbarium, but filling a gap between collection locations, some of which are yet to be vouchered.
Euphorbia clementii	Prostrate or spreading herb to 0.3 m tall, with small, greenish flowers in May and August (Halford and Harris 2012).	Heavy clay soils on open plains and gentle slopes.	•	•		•	•	•	**Known to occur**: recorded by Pilbara Iron (2009) at one location in the Survey Area; four other records from the Study Area. Suitable habitat throughout the Survey Area.	**Recorded**: six individuals were recorded during the 2025 survey.
Euphorbia inappendiculata var. *inappendiculata*	Prostrate or spreading herb to 0.3 m tall, with small, greenish flowers in May and August (Halford and Harris 2012).	Heavy clay soils on open plains and gentle slopes.	•	•		•		•	**Likely to occur**: suitable habitat likely to be present in the Survey Area. Three records from the Study Area, including in proximity; NR=5 km northwest (Biota 2024a).	**Recorded**: two individuals were recorded during the 2025 survey.
Euphorbia inappendiculata var. *queenslandica*	Prostrate or spreading herb to 0.3 m tall, with small, greenish-yellow flowers in late spring to early summer (Halford and Harris 2012).	Cracking clay soils on plains or gently undulating terrain.						•	**Likely to occur**: suitable habitat likely to be present in the Survey Area. One record within the Study Area, in proximity to the Survey Area; NR=3 km north (Biota 2024a).	**Recorded:** one individual was recorded during the 2025 survey.
Gymnanthera cunninghamii	Erect shrub to 2.0 m tall with cream, yellow or green flowers from January to February.	Sandy soils of drainage lines.				•		•	**May occur**: no previous records from the Study Area, but records to the east and west; suitable habitat may be present within the Survey Area; NR=52 km southwest (SLR Consulting 2024).	**Unlikely to occur**: suitable habitat was present (e.g. vegetation Ev AsyAcoAthe EuaErbChf Cyv), but species was not recorded during the survey.

Taxon	Habit *	Habitat *	Database Searches					Previous Survey Occurrence	Likelihood of Occurrence	
			TPFL	WAH	EPBC PMST	NatureMap	ALA		Initial Ranking Based on Desktop Study (NR = nearest record).	Final Ranking Including Results of Survey
Heliotropium murinum	Perennial herb to 0.4 m tall with flowers in May or September.	Red sandy plains.		•		•	•		**May occur**: suitable habitat may be present in the Survey Area, but not known to occur as far north as the Survey Area to date. Two records from the Study Area; NR=20.5 km south (WA Herbarium 2025).	**Unlikely to occur**: while suitable habitat was present (e.g. vegetation TeTsc AacAancAi ChCflCoz), this species was not recorded during the survey.
Rothia indica subsp. *australis*	Prostrate annual herb to 0.3 m tall, with yellow flowers from April to August.	Sand hills and sandy flats.		•		•			**May occur**: suitable habitat may be present in the Survey Area. Several previous records from the Study Area but none in proximity; NR=30 km south (Focused Vision 2022).	**Unlikely to occur**: some potentially suitable habitat was present (e.g. vegetation TeTsc AacAancAi ChCflCoz), but species was not recorded during the survey.
Tribulopis marliesiae	Slender herb to 0.4 m high with yellow flowers from August to November (Barrett and Barrett 2015).	Red sands in heath and low pindan (Barrett and Barrett 2015).		•				•	**Unlikely to occur**: some suitable habitat may be present in the eastern Survey Area, but no previous records from the Study Area. NR=84 km southeast (Biota 2024a).	**Possibly recorded**: One specimen was unable to be determined to species level due to inadequate material; this was referred to as *Tribulopis* sp. (*marliesiae/angustifolia*) and may represent the P3 taxon, or the more common *T. angustifolia*.
Uvedalia clementii	Erect herb to 0.2 m high with blue and yellow/purple flowers in July and August.	Red to brown clay in floodplains and claypans.							**Unlikely to occur**: not identified by the desktop study as there were no previous records from the locality; not known to occur as far north as the Survey Area; NR=257 km southwest (WA Herbarium 2025).	**Recorded**: one individual was recorded during the 2025 survey, representing a substantial range extension.
Priority 4										
Bulbostylis burbidgeae	Erect to spreading sedge, up to 0.3 m high with brown flowers in May, June or August.	Granitic soils, granite outcrops and cli_ bases.		•		•	•	•	**May occur**: suitable habitat may be present in the Survey Area. Three previous records from the Study Area, including in proximity to the Survey Area; NR=11 km east (WA Herbarium 2025).	**Unlikely to occur**: no particularly suitable habitat.
Ptilotus mollis	Perennial shrub to 0.5 m high with white or pink flowers in May or September.	Stony hills and screes.		•		•	•		**Unlikely to occur**: suitable habitat unlikely to be present in the Survey Area, and species is not known to occur this far north. One historical record from the Study Area, dated 1941, is located 30 km south of the Survey Area (WA Herbarium 2025).	**Unlikely to occur**: no suitable habitat.

Appendix 4

Vegetation Condition Assessment Scale

Vegetation condition scale adapted from Keighery (1994) and Trudgen (2002), as per the BHP *Vegetation and Flora Survey Procedure* (no. 0124627, Version 3.0; BHP undated).

Condition Scale	Description
Excellent (1)	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good (2)	Some relatively slight signs of damage caused by human activities since European settlement. For example, some sings of damage to tree trunks cause by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good (3)	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor (4)	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded (5)	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded (6)	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 5

Vegetation Classification Framework

Vegetation Classification. Vegetation classification for the Pilbara region, based on Specht (1970) as modified by Aplin (1979) and Trudgen (2002). These follow the BHP Vegetation and Flora Survey Procedure (no. 0124627, Version 3.0; BHP undated) requirements.

Height Class	Canopy cover				
	100-70%	70-30%	30-10%	10-2%	<2%
Trees > 30 m	High Closed Forest	High Open Forest	High Woodland	High Open Woodland	Scattered Tall Trees
Trees 10-30 m	Closed Forest	Open Forest	Woodland	Open Woodland	Scattered Trees
Trees < 10 m	Low Closed Woodland	Low Open Forest	Low Woodland	Low Open Woodland	Scattered Low Trees
Mallee	Closed Mallee	Mallee	Open Mallee	Very Open Mallee	Scattered Mallee
Shrubs > 2 m	Closed Scrub	Open Scrub	High Shrubland	High Open Shrubland	Scattered Tall Shrubs
Shrubs 1-2 m	Closed Heath	Open Heath	Shrubland	Open Shrubland	Scattered Shrubs
Shrubs < 1 m	Low Closed Heath	Low Open Heath	Low Shrubland	Low Open Shrubland	Low Scattered Shrubs
Hummock Grass	Closed Hummock Grassland	Hummock Grassland	Open Hummock Grassland	Very Open Hummock Grassland	Scattered Hummock Grass
Tussock Grass	Closed Tussock Grassland	Tussock Grassland	Open Tussock Grassland	Very Open Tussock Grassland	Scattered Tussock Grass
Bunch Grass	Closed Bunch Grassland	Bunch Grassland	Open Bunch Grassland	Very Open Bunch Grassland	Scattered Bunch Grass
Sedges	Closed Sedges	Sedges	Open Sedges	Very Open Sedges	Scattered Sedges
Herbs	Closed Herbs	Herbs	Open Herbs	Very Open Herbs	Scattered Herbs

Vegetation Units. Vegetation unit descriptions are based on standard methodologies used under the National Vegetation Information System (NVIS Technical Working Group 2017). These follow the BHP Vegetation and Flora Survey Procedure (no. 0124627, Version 3.0; BHP undated) requirements.

Description	Species	Cover	Soils	Landscape Position	Example
Broad Floristic Formation	One dominant genus name for the dominant stratum (e.g. *Acacia*)	One cover class for dominant stratum (e.g. Open Scrub)	-	-	*Acacia* Open Scrub
Vegetation association	Up to three dominant species for each stratum (e.g. *Acacia pyrifolia*, *A. hilliana*, and *A. maitlandii*)	One cover class code for each stratum (e.g. Open Scrub, Hummock Grassland, and Scattered Tall Trees)	State soil association (e.g. red silty sand)	Include the landscape position (e.g. upper slope and hill crest)	Open Scrub of *Acacia pyrifolia*, *A. hilliana* and *A. maitlandii* over Hummock Grassland of Triodia *wiseana* and *T. epactia* with Scattered Tall Trees of *Eucalyptus leucophloia* on red silty sand on upper slope and hill crest)

Vegetation Strata. Vegetation stratum levels have been modified from the National Vegetation Information System (NVIS Technical Working Group 2017). These follow the BHP Vegetation and Flora Survey Procedure (no. 0124627, Version 3.0; BHP undated) requirements.

Stratum Description	Example Growth Forms
Over-storey (U)	
Tallest tree sub-stratum; for forests and woodlands this will generally be the dominant stratum	Trees, tree mallee, palms, and vines (mallee shrubs).
Sub-canopy layer; second tree layer	
Sub-canopy layer; third tree layer	
Mid-storey (M)	
Tallest shrub layer	Shrubs, low trees, mallee shrubs, grass-trees, tree-ferns, cycads, palms, and vines (low shrubs, tall grasses, tall forbs, tall sedges).
Second shrub layer	
Third shrub layer	
Understorey (G)	
Tallest ground species	Grasses, forbs, sedges, rushes, lichens, epiphytes, low shrubs, ferns, bryophytes, cycads, grass-trees, and vines.
Other ground species	

Appendix 6

Summarised Data from Flora Sites

Mt Goldsworthy Detailed Flora Survey Site MGW-01

Described by RWLD

Date 25/03/2025

Type Quadrat 50x50m

MGA Zone 50 760433 mE, 7744709 mN

Habitat Drainage Area / Floodplain.

Soil Reddish brown light clay.

Rock Type None present.

Vegetation Open Hummock Grassland of *Triodia epactia* with a Very Open Tussock Grassland of *Chrysopogon fallax* and *Eragrostis xerophila* with Scattered Low Trees of *Eucalyptus victrix.*

Veg Condition Very Good. Weeds present and signs of cattle.

Fire Age Moderate (3-5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Bulbostylis barbata	0.1	2		
**Cenchrus ciliaris*	0.1	20		
**Cenchrus setiger*	0.1	40	MGW01-16	N=1.
Chloris pectinata	0.1	25	MGW01-08	
Chrysopogon fallax	3	110		
Commelina ensifolia	0.1	20	MGW01-19	
Corchorus tridens	0.1	5	MGW01-09	
Cyperus bulbosus	0.1	20	MGW01-18	
Dactyloctenium radulans	0.1	2		
Dichanthium sericeum subsp. *humilius*	0.1	25	MGW01-11	
**Echinochloa colona*	0.1	15		
Eragrostis cumingii	0.1	25	MGW01-10	
Eragrostis xerophila	1	40	MGW01-03	Sens. lat.
Eucalyptus victrix	1	480		
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MGW01-14	Confirmed by WAH.
Euphorbia trigonosperma	0.1	15	MGW01-15	
Fimbristylis dichotoma	0.1	30	MGW01-04	
Ipomoea coptica	0.1	3		
Iseilema vaginiflorum	0.1	25	MGW01-12	
Neptunia sp.	0.1	3	MGW01-21	*N. ? scutata;* inadequate material; sterile.
Pluchea rubelliflora	0.1	15	MGW01-13	
Portulaca sp.	0.1	2		*P. pilosa/decipiens;* inadequate material.
Ptilotus murrayi	1.5	15	MGW01-02	
Sporobolus australasicus	0.1	15	MGW01-05	
Trianthema triquetrum	0.1	4	MGW01-20	
Triodia epactia	18	30	MGW01-01	Sens. lat.
Urochloa distachyos	0.1	25	MGW01-07, 17	
Uvedalia clementii	0.1	1	MGW02-01=	
**Vachellia farnesiana*	0.1	120		N=2.
Xerochloa laniflora	0.1	25	MGW01-06	

MWG-01

Mt Goldsworthy Detailed Flora Survey Site MGW-02

Described by RWLD

Date 25/03/2025

Type Quadrat 25x100m

MGA Zone 50 760799 mE, 7745001 mN

Habitat Medium Drainage Line.

Soil Light reddish brown light to medium clay.

Rock Type None present.

Vegetation High Open Shrubland of *Atalaya hemiglauca* with Scattered Shrubs of *Carissa lanceolata* and **Vachellia farnesiana* with a Tussock Grassland of *Eulalia aurea*, *Chrysopogon fallax* and *Eriachne benthamii* with a Low Woodland of *Eucalyptus victrix.*

Veg Condition Very Good. Weed present and signs of cattle.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia colei	0.1	220	MGW02-10	var. indet.; inadequate material; sterile.
Afrohybanthus aurantiacus	0.1	50		
Alternanthera nodiflora	0.1	20	MGW02-04	
Ammannia multiflora	0.1	15	MGW02-13	
Atalaya hemiglauca	4	350		
Basilicum polystachyon	0.1	30	MGW02-03	
Boerhavia burbidgeana	0.1	5	MGW02-06	
Bulbostylis turbinata	0.1	10	MGW02-16	
Carissa lanceolata	0.5	150		
Centipeda minima subsp. *minima*	0.1	5		
Chrysopogon fallax	15	130		
Cyperus vaginatus	1.5	120		
**Echinochloa colona*	0.1	50		
Ehretia saligna var. *saligna*	0.1	170		
Eragrostis exigua	0.1	40	MGW02-09	
Eriachne benthamii	5	85	MGW02-02	
Eriachne glauca var. *glauca*	0.1	30	MGW02-15	
Eucalyptus victrix	17	600		
Eulalia aurea	40	150		
Euphorbia fitzroyensis	0.1	15	MGW02-05	Confirmed by WAH.
Fimbristylis littoralis	0.1	30	MGW02-07	
Indigofera oblongifolia	0.1	50	MGW02-11	
Ipomoea coptica	0.1	10		
Josephinia sp. indet.	0.1	10	MGW02-17	Indet.; inadequate material; potentially *J.* sp. Woodstock.
Ludwigia perennis	0.1	20		
Marsilea hirsuta	0.1	5		
Neptunia scutata	0.1	5	MGW02-14	
Operculina aequisepala	0.1	15		
Portulaca oleracea	0.1	10	MGW02-12	Sens. lat.
Portulaca sp.	0.1	5		Inadequate material; sterile.
Ptilotus murrayi	0.1	15	MGW02-08	
Sesbania cannabina	0.1	25		
Trichodesma zeylanicum var. *zeylanicum*	0.1	5		Juvenile.

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Uvedalia clementii	0.1	20	MGW02-01	Confirmed by WAH.
**Vachellia farnesiana*	0.5	200		N=8.
Vigna lanceolata var. *lanceolata*	0.1	30		

MGW-02

Mt Goldsworthy Detailed Flora Survey Site MGW-03

Described by JTMW

Date 25/03/2025

Type Quadrat 50x50m

MGA Zone 50 761092 mE, 7744849 mN

Habitat Drainage Area / Floodplain.

Soil Reddish brown light to medium clay.

Rock Type None present.

Vegetation Scattered Hummock Grasses of *Triodia epactia* with an Open Tussock Grassland of *Chrysopogon fallax*, Eriachne *benthamii*, *Eragrostis xerophila* with Scattered Low Trees of *Eucalyptus victrix*.

Veg Condition Very Good. **Cenchrus setiger* present and signs of cattle.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Bulbostylis turbinata	0.1	5	MGW03-18	
**Cenchrus setiger*	0.1	10		
Chloris pectinata	0.1	20	MGW03-15	
Chrysopogon fallax	7	100		
Corchorus tridens	0.1	5	MGW03-01	
Cyperus iria	0.1	25	MGW03-16	
Dichanthium sericeum subsp. *humilius*	3	25		
Eragrostis xerophila	5	45	MGW03-08	Sens. lat.
Eriachne benthamii	5	60	MGW03-10	
Eucalyptus victrix	0.5	350		
Eulalia aurea	2	90		
Euphorbia fitzroyensis	0.1	20	MGW03-05, 20	
Euphorbia inappendiculata var. *inappendiculata*	0.1	1	MGW03-03	
Fimbristylis dichotoma	0.1	20	MGW03-11	
**Flaveria trinervia*	0.1	10	MGW03-02	
Indigofera trita subsp. *trita*	0.1	6	MGW03-04	
Ipomoea coptica	0.1	5		
Iseilema macratherum	0.1	3	MGW03-06	Sens. lat.
Neptunia scutata	0.1	20	MGW02-14=	
Panicum laevinode	4	30	MGW03-07	Confirmed by WAH.
Pluchea rubelliflora	0.1	20	MGW03-19	
Portulaca oleracea	0.1	8	MGW03-13	Sens. lat.
Ptilotus murrayi	0.5	12	MGW03-12	
Sesbania cannabina	0.1	60	MGW03-17	
Sporobolus australasicus	0.1	10		
Sporobolus mitchellii	0.1	40	MGW03-09	
Stemodia kingii	0.1	30	MGW03-14	
Triodia epactia	1.5	3		
Uvedalia clementii	0.1	5	MGW02-01=	
Vigna lanceolata var. *lanceolata*	0.1	5		
Xerochloa laniflora	0.1	25	MGW03-21	Confirmed by WAH.

MGW-03

Mt Goldsworthy Detailed Flora Survey Site MGW-04

Described by JTMW

Date 26/03/2025

Type Quadrat 50x50m

MGA Zone 50 765425 mE, 7744877 mN

Habitat Sandy/Stony Plain.

Soil Dark reddish brown sandy clay loam.

Rock Type Ironstone.

Vegetation Open Hummock Grassland of *Triodia epactia* with Scattered Tall Shrubs of *Acacia synchronicia* and *Acacia inaequilatera* with Scattered Shrubs of *Senna artemisioides* subsp. *oligophylla.*

Veg Condition Excellent. Minor signs of cattle.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia colei	0.1	135	MGW04-11	var. indet.; inadequate material; sterile.
Acacia inaequilatera	0.5	290		
Acacia synchronicia	1.25	300		
Aristida holathera var. *holathera*	0.1	40		
Bonamia media	0.1	7	MGW04-10	
Bonamia pannosa	0.1	5		
Bulbostylis barbata	0.1	15	MGW04-09	
Chrysopogon fallax	0.1	95		
Corchorus sp.	0.1	20	MGW04-04	Inadequate material; sterile.
Corchorus tridens	0.1	15	MGW45-05=	
Cullen sp.	0.1	25	MGW04-05	? *pogonocarpum*; inadequate material; sterile.
Dactyloctenium radulans	0.1	5		
Dichanthium sericeum subsp. *humilius*	0.1	40		
Eragrostis crateriformis	0.1	20	MGW23-03=	
Eragrostis tenellula	0.1	20	MGW04-03	
Eriachne glauca var. *glauca*	0.1	20	MGW04-08	
Eulalia aurea	0.1	70		
Euphorbia vaccaria var. *vaccaria*	0.1	2	MGW04-07	
Evolvulus alsinoides var. *villosicalyx*	0.1	25		
Iseilema dolichotrichum	0.1	20	MGW04-02	
Neptunia scutata	0.1	20	MGW02-14=	
Panicum australiense var. *australiense*	0.1	10		
Pluchea tetranthera	0.1	50	MGW04-01	
Portulaca sp.	0.1	5	MGW45-04=	(*oleracea / intraterranea*).
Senna artemisioides subsp. *oligophylla*	1.5	80	MGW04-06	(thinly sericeous form MET 15,035).
Senna notabilis	0.1	30		
Sporobolus australasicus	0.1	25		
Triodia epactia	27	65		

MGW-04

Mt Goldsworthy Detailed Flora Survey Site MGW-05

Described by JTMW

Date 26/03/2025

Type Quadrat 50x50m

MGA Zone 50 765190 mE, 7745231 mN

Habitat Sandy / Stony plain.

Soil Dark red loamy sand.

Rock Type None present.

Vegetation Very Open Hummock Grassland of *Triodia epactia* with a High Open Shrubland of *Acacia ancistrocarpa* and *Acacia acradenia* with Very Open herbs of *Arivela viscosa.*

Veg Condition Very Good. **Cenchrus ciliaris* present and signs of cattle.

Fire Age Moderate (3 to 5 yr).

Name	Cover (%)	Height (cm)	Specimen	Notes
Abutilon otocarpum	0.1	5		
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	25	MGW05-09	
Acacia acradenia	0.25	230		
Acacia ancistrocarpa	3	400	MGW05-01	
Acacia colei	0.1	175	MGW04-11=	var. indet.; inadequate material; sterile.
Acacia inaequilatera	0.1	185		
Afrohybanthus aurantiacus	0.1	25		
Alysicarpus muelleri	0.1	40		
Arivela uncifera	0.1	25		
Arivela viscosa	2	65		
Boerhavia coccinea	0.1	5	MGW05-03	
Bonamia media	0.1	5	MGW04-10=	
Bonamia pannosa	0.1	25		
Bulbostylis barbata	0.1	10	MGW04-09=	
Cajanus marmoratus	0.1	15	MGW05-07	
**Cenchrus ciliaris*	0.1	65		
Corchorus elachocarpus	0.1	30	MGW05-12	
Corchorus sp.	0.1	15	MGW04-04=	
Crotalaria ramosissima	0.1	25	MGW05-06	
Cucumis variabilis	0.1	110		
Cullen sp.	0.1	25	MGW04-05=	? *pogonocarpum*; inadequate material; sterile.
Cullen sp.	0.1	20	MGW05-04	? *stipulaceum*; inadequate material; juvenile.
Dactyloctenium radulans	0.1	5		
Goodenia microptera	0.1	15	MGW13-08=	
Grevillea wickhamii	0.1	85	Sterile.	
Indigofera colutea	0.1	10		
Isotropis atropurpurea	0.1	20		
Neptunia scutata	0.1	25	MGW02-14=	
Panicum australiense var. *australiense*	0.1	10		
Paspalidium rarum	0.1	20	MGW05-08	
Polycarpaea corymbosa var. *corymbosa*	0.1	15		

Name	Cover (%)	Height (cm)	Specimen	Notes
Polymeria ambigua	0.1	20		
Portulaca oleracea	0.1	3		
Pterocaulon sphacelatum	0.1	10		
Ptilotus auriculifolius	0.1	25		
Ptilotus axillaris	0.1	10	MGW13-09=	
Ptilotus fusiformis	0.1	65		
Senna artemisioides subsp. *oligophylla*	0.1	80	MGW05-02	(thinly sericeous form MET 15,035).
Senna notabilis	0.1	25		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	35	MGW05-11	
Solanum sp.	0.1	15		*S. perarmatum / cleistogamum;* indet.
Sporobolus australasicus	0.1	15		
Tephrosia sp.	0.1	20	MGW05-05	? sp. Northern (K.F. Kenneally 11950); inadequate material; sterile; atypically long petiole.
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	30	MGW05-10	
Trianthema pilosum	0.1	20	MGW13-20=	
Tribulopis angustifolia	0.1	25	MGW13-07=	
Tribulus hirsutus	0.1	15		
Trigastrotheca molluginea	0.1	15		
Triodia epactia	9	65		

MGW-05

Mt Goldsworthy Detailed Flora Survey Site MGW-06

Described by RWLD

Date 26/03/2025

Type Quadrat 50x50m

MGA Zone 50 764954 mE, 7744614 mN

Habitat Gilgai Plain.

Soil Yellowish red medium clay.

Rock Type None present.

Vegetation Closed Tussock Grassland of *Eragrostis xerophila* (*Eriachne glauca* var. *glauca*, *Eragrostis tenellula*, *Dichanthium sericeum* subsp. *humilius*, *Iseilema membranaceum.*

Veg Condition Very Good. Weeds present.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Codes	Notes
Ammannia multiflora	0.1	20	MGW06-12	Confirmed by WAH.
Bergia pedicellaris	0.1	4	MGW06-13	
Blumea tenella	0.1	4	MGW06-14	
Corchorus tridens	0.1	20	MGW06-15	
Cyperus iria	0.1	15	MGW06-09	
Dichanthium sericeum subsp. *humilius*	3	25	MGW06-07	
**Echinochloa colona*	0.1	25		
Elytrophorus spicatus	0.1	20	MGW06-11	
Eragrostis tenellula	3	30	MGW06-04	
Eragrostis xerophila	60	40	MGW06-01	Sens. lat.
Eriachne glauca var. *glauca*	5	35	MGW06-02	
Grona sp.	0.1	25	MGW06-08	? muelleri; inadequate material; sterile
Indigofera trita subsp. *trita*	0.1	15	MGW06-20	
Ipomoea coptica	0.1	20		
Iseilema membranaceum	1	30	MGW06-06	Sens. lat.
Ludwigia perennis	0.1	80	MGW06-19	
Marsilea hirsuta	0.1	5		
Mimulus gracilis	0.1	5	MGW06-10	Submitted to WAH.
Nellica maderaspatensis	0.1	15		
Neptunia scutata	0.1	20	MNRW02=	
Operculina aequisepala	0.1	20		
Peplidium muelleri	0.1	1	MGW06-18	
Portulaca oleracea	0.1	10		
Portulaca sp.	0.1	20		(*pilosa/decipiens*); inadequate material.
Ptilotus murrayi	0.1	15		
Schoenoplectiella laevis	0.1	20	MGW06-16A	
Sesbania cannabina	0.1	140		
Sida fibulifera	0.1	4	MGW06-21	Sens. lat.
Stemodia kingii	0.1	15	MGW06-17	
Streptoglossa tenuiflora	0.5	25	MGW06-05	Confirmed by WAH.
**Vachellia farnesiana*	0.1	40		N=1.
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	25	MGW06-03	

MGW-06

Mt Goldsworthy Detailed Flora Survey Site MGW-07

Described by RWLD

Date 26/03/2025

Type Quadrat 50x50m

MGA Zone 50 764801 mE, 7744870 mN

Habitat Sandy / Stony Plain.

Soil Red sandy clay loam.

Rock Type Ironstone.

Vegetation Open Hummock Grassland of *Triodia epactia* with Scattered Tussock Grass of *Chrysopogon fallax* with Scattered Tall Shrubs of *Acacia colei* and *Acacia synchronicia.*

Veg Condition Excellent. Old signs of cattle.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia colei	0.5	200		var. indet.; inadequate material; no pods.
Acacia synchronicia	0.5	230		
Arivela viscosa	0.1	25		
Bonamia pannosa	0.1	10	MGW07-05	
Bulbostylis barbata	0.1	5		
Calandrinia ptychosperma	0.1	5	MGW07-08	
Chrysopogon fallax	0.5	150		
Cullen sp.	0.1	20	MGW07-07	? *pogonocarpum.*
Cyperus iria	0.1	15	MGW06-09=	
Dactyloctenium radulans	0.1	10		
Eragrostis dielsii	0.1	5	MGW07-11	Sens. lat.
Eragrostis tenellula	0.1	15		
Eriachne aristidea	0.1	20		
Eriachne glauca var. *glauca*	0.1	10	MGW07-05A	
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Goodenia microptera	0.1	5		
Ipomoea coptica	0.1	20		
Neptunia scutata	0.1	10	MNRW02=	
Panicum australiense var. *australiense*	0.1	5	MGW07-03	
Paspalidium rarum	0.1	20	MGW07-04	
Pluchea tetranthera	0.1	80	OPP-LD01=	
Polycarpaea longiflora	0.1	10		
Polymeria ambigua	0.1	10	MGW07-06	*Polymeria* sp. (Site 1365) PL de Kock ID.
Portulaca oleracea	0.1	15		
Ptilotus fusiformis	0.1	30	MGW07-01	
Ptilotus murrayi	0.1	5		
Senna artemisioides subsp. *oligophylla*	0.1	20	MGW07-10	(thinly sericeous form MET 15,035).
Senna notabilis	0.1	10		
Sida fibulifera	0.1	5	MGW07-12	Sens. lat.
Streptoglossa decurrens	0.1	15		
Trianthema triquetrum	0.1	10	MGW07-09	
Trigastrotheca molluginea	0.1	10		

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Triodia epactia	28	80	MGW07-02	

MGW-07

Mt Goldsworthy Detailed Flora Survey Site MGW-08

Described by JTMW

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 765480 mE, 7745851 mN

Habitat Sandy / Stony Plain.

Soil Dark yellowish brown sand.

Rock Type None present.

Vegetation Open Shrubland of *Acacia ancistrocarpa* with a Very Open Hummock Grassland of *Triodia schinzii, (T. epactia)* with Scattered Low Trees of *Corymbia hamersleyana*.

Veg Condition Very Good. **Cenchrus ciliaris* present and old signs of cattle.

Fire Age Moderate (3 – 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Abutilon otocarpum	0.1	25		
Acacia ancistrocarpa	5	120	MGW05-01=	
Acacia inaequilatera	0.25	210		
Afrohybanthus aurantiacus	0.1	35		
Aristida holathera var. *holathera*	0.1	35		
Arivela uncifera	0.1	30	MGW08-03	
Arivela viscosa	0.1	50		
Boerhavia coccinea	0.1	15	MGW05-03=	
Bonamia erecta	0.1	40		
Bonamia linearis	0.1	15	MGW08-05	Submitted to WAH.
Bonamia media	0.1	15	MGW04-10=	
Bonamia pannosa	0.1	30		
Bulbostylis barbata	0.1	5	MGW04-09=	
Carissa lanceolata	0.1	160		
**Cenchrus ciliaris*	0.25	45		
Chrysopogon fallax	0.1	110		
Corchorus sp.	0.1	15	MGW04-04=	Inadequate material; sterile.
Corymbia hamersleyana	1.5	510		
Cullen martinii	0.1	20	MGW08-06	
Eragrostis eriopoda	0.1	80	MGW08-07	
Eriachne obtusa	0.1	50		
Euphorbia clementii	0.1	30	MGW08-02	
Euphorbia vaccaria var. *vaccaria*	0.1	1	MGW04-07=	
Euploca sp.	0.1	6	MGW08-08	? *pachyphylla*; inadequate material; sterile.
Goodenia microptera	0.1	20		
Gossypium australe	0.1	25		
Indigofera linifolia	0.1	15		
Isotropis atropurpurea	0.1	5		
Panicum australiense var. *australiense*	0.1	25		
Polygala isingii	0.1	15	MGW45-07=	
Portulaca sp.	0.1	2		Inadequate material; sterile.
Ptilotus axillaris	0.1	20	MGW13-09=	
Ptilotus fusiformis	0.1	55		

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Senna notabilis	0.1	15		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	35	MGW08-04	
Solanum diversiflorum	0.1	25		
Sporobolus australasicus	0.1	25		
Tephrosia rosea var. *clementii*	0.1	25	MGW13-12=	
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	30	MGW05-10=	
Trianthema pilosum	0.1	30	MGW13-20=	
Tribulus hirsutus	0.5	20		
Trigastrotheca molluginea	0.1	6		
Triodia epactia	0.5	65		
Triodia schinzii	11	45	MGW08-01	

MGW-08

Mt Goldsworthy Detailed Flora Survey Site MGW-09

Described by JTMW

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 766159 mE, 7745426 mN

Habitat Sandy / Stony Plain.

Soil Dark reddish brown loamy sand.

Rock Type Basalt, Chert, Granite, Ironstone, Quartz, Shale.

Vegetation Open Shrubland of *Acacia ancistrocarpa* with a Very Open Hummock Grassland of *Triodia schinzii,* (*T. epactia*) with Scattered Low Trees of *Corymbia hamersleyana*.

Veg Condition Excellent. Minor signs of cattle.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	0.5	150		
Acacia ancistrocarpa	0.5	125	MGW05-01=	
Acacia inaequilatera	0.1	65		
Acacia sphaerostachya	0.1	50	MGW09-05	
Aristida holathera var. *holathera*	0.1	35		
Arivela viscosa	0.1	25		
Bonamia media	0.1	3	MGW04-10=	
Bonamia pannosa	0.1	20		
Bonamia pilbarensis	0.1	5	MGW-MW01=	Port Hedland Form.
Bulbostylis barbata	0.1	15	MGW04-09=	
Corchorus sp.	0.1	20	MGW04-04=	Inadequate material; sterile.
Eriachne pulchella	0.1	25		
Euphorbia vaccaria var. *vaccaria*	0.1	2	MGW09-02	
Euploca sp.	0.1	10	MGW08-08=	*? pachyphylla*; inadequate material; sterile.
Euploca cunninghamii	0.1	25	MGW09-01	
Fimbristylis simulans	0.1	25	MGW13-06=	
Goodenia microptera	0.1	20		
Gossypium australe	0.1	30		
Grevillea pyramidalis subsp. *leucadendron*	0.5	350		
Notoleptopus decaisnei	0.1	20	MGW09-04	
Polycarpaea corymbosa var. *corymbosa*	0.1	25		
Portulaca oleracea	0.1	6		
Ptilotus axillaris	0.1	5	MGW13-09=	
Senna artemisioides subsp. *oligophylla*	0.1	25	MGW04-06=	(thinly sericeous form MET 15,035).
Sida echinocarpa	0.1	70	MGW09-03	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	30	MGW08-04=	
Solanum diversiflorum	0.1	4		
Sporobolus australasicus	0.1	30		
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	20	MGW05-10=	
Tribulus hirsutus	0.1	10		
Trigastrotheca molluginea	0.1	5		

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Triodia epactia	9	35		

MGW-09

Mt Goldsworthy Detailed Flora Survey Site MGW-10

Described by RWLD

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 765846 mE, 7746330 mN

Habitat Sandy / Stony Plain.

Soil Red sand.

Rock Type None present.

Vegetation Open Hummock Grassland of *Triodia Schinzii* with an Open Shrubland of *Acacia ancistrocarpa* and *Acacia acradenia* with Scattered Low Trees of *Corymbia zygophylla.*

Veg Condition Excellent.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	1	60	MGW10-12	
Acacia ancistrocarpa	2.5	180		
Acacia coriacea subsp. *coriacea*	0.1	170		
Acacia inaequilatera	0.1	170		
Aristida holathera var. *holathera*	0.1	35		
Arivela uncifera	0.1	15	MGW-RW04=	
Boerhavia sp.	0.1	10	MGW10-04	? *gardneri.*
Bonamia pannosa	0.1	25		
Bulbostylis barbata	0.1	5		
Corchorus sidoides subsp. *vermicularis*	0.1	30	MGW10-08	
Corymbia zygophylla	1.5	550	MGW10-01	
Eriachne helmsii	0.1	25	MGW10-03	
Euphorbia clementii	0.1	35	MGW10-11	Confirmed by WAH.
Goodenia microptera	0.1	5		
Grona filiformis	0.1	10	MGW10-06	
Hibiscus leptocladus	0.1	25	MGW10-07	Sens. lat.
Indigofera linifolia	0.1	20	MGW10-14	
Panicum australiense var. *australiense*	0.1	5	MGW10-10	
Paranotis pterospora	0.1	5	MGW10-09	
Ptilotus fusiformis	0.1	25		
Rhynchosia minima	0.1	5		
Senna notabilis	0.1	25		
Solanum diversiflorum	0.1	20	MGW10-13	
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0.1	10	MGW10-05	
Trianthema pilosum	0.1	10		
Tribulus macrocarpus	0.1	5		
Trigastrotheca molluginea	0.1	5		
Triodia schinzii	14	40	MGW10-02	

MGW-10

Mt Goldsworthy Detailed Flora Survey Site MGW-11

Described by RWLD

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 765662 mE, 7746505 mN

Habitat Sandy / Stony Plain.

Soil Red sand.

Rock Type None present.

Vegetation Low Open Woodland of *Eucalyptus odontocarpa* with an Open Hummock Grassland of *Triodia schinzii* with Scattered Herbs of *Trianthema pilosum.*

Veg Condition Excellent.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia adoxa var. *adoxa*	0.1	15	MGW11-05	
Acacia ancistrocarpa	0.1	150		
Acacia colei	0.1	100		var. indet.; inadequate material; sterile.
Acacia inaequilatera	0.1	120		
Afrohybanthus aurantiacus	0.1	30		
Aristida holathera var. *holathera*	0.1	45		
Arivela viscosa	0.1	80		
Bonamia erecta	0.1	25		
Bonamia pannosa	0.1	25	MNR04=	
Corchorus sidoides subsp. *vermicularis*	0.1	5	MGW10-08=	
Crotalaria ramosissima	0.1	20	MGW11-04	
Dodonaea coriacea	0.1	40	MGW11-06	
Eragrostis eriopoda	0.1	45	MGW11-01	
Eucalyptus odontocarpa	9	220	MNRW04-02=	
Euphorbia clementii	0.1	25	MGW10-11=	
Goodenia microptera	0.1	5		
Grevillea wickhamii	0.1	80		Sterile.
Hakea lorea subsp. *lorea*	0.1	130		
Hibiscus leptocladus	0.1	10	MGW10-07=	
Panicum australiense var. *australiense*	0.1	5	MGW10-10=	
Paranotis pterospora	0.1	25	MGW10-09=	
Ptilotus astrolasius	0.1	30	MGW11-03	
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0.1	5	MGW10-05=	
Trianthema pilosum	0.5	35		
Tribulopis angustifolia	0.1	15	MNLD02-04=	
Tribulus macrocarpus	0.1	5		
Triodia epactia	0.1	40	MGW11-02	Sens. lat.
Triodia schinzii	28	40	MGW10-02=	

MGW-11

Mt Goldsworthy Detailed Flora Survey Site MGW-12

Described by RWLD

Date 25/03/2025

Type Quadrat 50x50m

MGA Zone 50 763373 mE, 7745749 mN

Habitat Sandy / Stony Plain.

Soil Reddish brown clay loam.

Rock Type None present.

Vegetation Very Open herbs of *Eragrostis eriopoda* and *Eriachne obtusa* with an Open Hummock Grassland of *Triodia epactia* with a Tussock Grassland of *Bonamia erecta*, *Trianthema pilosa* and *Hybanthus aurantiacus* with Scattered Low Trees of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Tall Shrubs of *Acacia sericophylla*.

Veg Condition Very Good. **Cenchrus ciliaris* present.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Abutilon otocarpum	0.1	60		
Acacia acradenia	0.1	110	MGW12-03	
Acacia sericophylla	0.5	350	MGW12-19	
Acacia stellaticeps	0.1	80	MGW12-09	
Afrohybanthus aurantiacus	0.5	30		
Aristida holathera var. *holathera*	0.1	80		
Arivela viscosa	0.1	90		
Boerhavia sp.	0.5	50	MGW12-02	? *gardneri.*
Bonamia erecta	4	40		
Bonamia linearis	0.1	10	MGW12-17	Submitted to WAH.
Bonamia pannosa	0.5	18	MGW12-08	
Bulbostylis barbata	0.1	25		
**Cenchrus ciliaris*	3	25		
Chrysopogon fallax	0.1	130		
Corchorus sidoides subsp. *vermicularis*	0.1	35	MGW12-15	
Corymbia hamersleyana	1	400		
Crotalaria medicaginea var. *neglecta*	0.1	10		
Crotalaria ramosissima	0.1	50	MGW12-21	
Cucumis variabilis	0.1	50		
Eragrostis eriopoda	18	80		
Eriachne obtusa	18	50	MGW12-20	
Eucalyptus leucophloia subsp. *leucophloia*	0.5	700		
Euphorbia trigonosperma	0.1	35	MGW12-06	
Euphorbia vaccaria var. *vaccaria*	0.1	20	MGW12-05	
Fimbristylis ammobia	0.1	20	MGW12-10	
Goodenia forrestii	0.1	20		
Gossypium australe	0.1	90		BP form.
Grona filiformis	0.1	25	MGW12-23	
Hibiscus sturtii var. *campylochlamys*	0.1	50	MGW12-07	
Indigofera colutea	0.1	20		
Indigofera linifolia	0.1	25		
Isotropis atropurpurea	0.5	60		
Neurachne muelleri	0.1	25		
Panicum australiense var. *australiense*	0.1	15	MGW12-13	

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Perotis rara	0.1	15		
Portulaca oleracea	0.1	5		
Senna notabilis	0.1	50		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	90	MGW12-04	
Sida sp. Rabbit Flat (B.J. Carter 626)	0.1	30	MGW12-14	Confirmed by WAH.
Solanum sp.	0.1	5		S. *perarmatum / cleistogamum;* indet.; Juvenile.
Tephrosia rosea var. *clementii*	0.1	130	MGW12-16	
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0.1	35	MGW12-11	
Trianthema pilosum	1	30	MGW12-01	
Tribulopis sp.	0.1	15	MGW12-18	Confirmed by WAH as *marliesiae/angustifolia;* inadequate material.
Tribulus hirsutus	0.1	5		
Trigastrotheca molluginea	0.1	10		
Triodia epactia	15	90	MGW12-22	Sens. lat.

MGW-12

Mt Goldsworthy Detailed Flora Survey Site MGW-13

Described by JTMW

Date 25/03/2025

Type Quadrat 50x50m

MGA Zone 50 763435 mE, 7745920 mN

Habitat Sandy / Stony Plain.

Soil Light reddish brown sandy clay loam.

Rock Type Ironstone.

Vegetation Open Hummock Grassland of *Triodia epactia* with a Low Open Shrubland of *Acacia acradenia* with a Low Open Woodland *Corymbia hamersleyana* with a Very Open Tussock Grassland of *Eriachne obtusa* with Very Open Herbs of *Trigastrotheca molluginea*.

Veg Condition Very Good. **Cenchrus ciliaris* present.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Abutilon otocarpum	0.1	30		
Acacia acradenia	6	60		
Acacia inaequilatera	0.1	65		
Afrohybanthus aurantiacus	0.1	50		
Aristida holathera var. *holathera*	0.1	50		
Aristida hygrometrica	0.1	55	MGW13-21	
Arivela viscosa	0.1	25		
Boerhavia coccinea	0.1	10	MGW13-10	
Bonamia erecta	0.1	35		
Bonamia pannosa	0.1	10		
Bonamia pilbarensis	0.1	5	MGW13-01	
Bulbostylis barbata	0.1	5	MGW13-02	
Carissa lanceolata	0.1	145		
**Cenchrus ciliaris*	0.1	50		
Codonocarpus cotinifolius	0.1	45		Juvenile.
Corchorus parviflorus	0.1	45	MGW13-16	
Corchorus sidoides subsp. *vermicularis*	0.1	40	MGW13-15	
Corymbia hamersleyana	3	400		
Crotalaria medicaginea var. *neglecta*	0.1	45		
Dampiera candicans	0.1	60		
Dodonaea coriacea	0.1	55	MGW13-23	
Eragrostis eriopoda	0.1	80	MGW13-19	
Eriachne aristidea	0.1	30	MGW13-18	
Eriachne obtusa	2	45	MGW13-04	
Eriachne pulchella	0.1	13		
Euphorbia trigonosperma	0.1	5	MGW13-13	
Fimbristylis simulans	0.1	20	MGW13-06	
Gomphrena a[inis subsp. *pilbarensis*	0.1	25	MGW13-17B	
Gomphrena cunninghamii	0.1	22	MGW13-17A	
Goodenia microptera	0.1	22	MGW13-08	
Grevillea pyramidalis subsp. *leucadendron*	0.1	65		
Grevillea wickhamii	0.1	145		Sterile.
Grona filiformis	0.1	15	MGW13-24	
Hakea lorea subsp. *lorea*	0.1	70		Regrowth.
Hibiscus sturtii var. *campylochlamys*	0.1	40	MGW13-05	

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Notoleptopus decaisnei	0.1	5		
Panicum australiense var. *australiense*	0.1	10		
Paspalidium clementii	0.1	25		
Polycarpaea holtzei	0.1	4		
Polygala glaucifolia	0.1	2	MGW13-03	
Polymeria ambigua	0.1	5	MGW13-22	*Polymeria* sp. (Site1365) PL de Kock ID.
Polymeria ambigua	0.1	10		
Portulaca oleracea	0.1	5		
Ptilotus auriculifolius	0.1	25		
Ptilotus axillaris	0.1	5	MGW13-09	
Ptilotus calostachyus	0.1	70		
Ptilotus exaltatus	0.1	35		
Ptilotus fusiformis	0.1	50		
Sida rohlenae subsp. *rohlenae*	0.1	45	MGW13-14	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	20		
Solanum diversiflorum	0.1	25		
Sporobolus australasicus	0.1	25		
Tephrosia rosea var. *clementii*	0.1	110	MGW13-12	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	15	MGW13-11	
Trianthema pilosum	0.1	15	MGW13-20	
Tribulopis angustifolia	0.1	5	MGW13-07	
Tribulus hirsutus	0.1	5		
Trigastrotheca molluginea	3	10		
Triodia epactia	13	55		

MGW-13

Mt Goldsworthy Detailed Flora Survey Site MGW-14

Described by JTMW

Date 28/03/2025

Type Quadrat 50x50m

MGA Zone 50 761841 mE, 7744667 mN

Habitat Gilgai Plain.

Soil Yellowish red medium clay.

Rock Type None present.

Vegetation Closed Tussock Grassland of *Eragrostis xerophila*, (*Cynodon convergens*, *Dichanthium sericeum* subsp. *humilius*) with Scattered Herbs of *Ptilotus murrayi.*

Veg Condition Very Good. Signs of cattle.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Arivela viscosa	0.1	35		
Bulbostylis turbinata	0.1	20	MGW45-06=	
Chloris pectinata	0.1	15	MGW14-02	
Corchorus tridens	0.1	2	MGW14-09	
Cynodon convergens	12	30	MGW14-01	
Cyperus bulbosus	0.1	25	MGW14-14	
Dactyloctenium radulans	0.1	5		
Dichanthium sericeum subsp. *humilius*	9	40		
Eragrostis tenellula	0.1	40	MGW04-03=	
Eragrostis xerophila	20	60	MGW03-08=	Sens. lat.
Eriachne benthamii	1	65	MGW03-10=	
Eriachne glauca var. *glauca*	8	35	MGW14-08	
Euphorbia fitzroyensis	0.1	5	MGW14-11	
Ipomoea coptica	0.1	25		
Iseilema dolichotrichum	8	25	MGW14-03A	Inadequate material; sterile.
Iseilema membranaceum	8	25	MGW14-03B	
Marsilea sp.	0.1	15	MGW14-17	Inadequate material; sterile.
Nellica maderaspatensis	0.1	20	MGW14-15	
Neptunia scutata	0.1	5	MGW02-14=	
Panicum laevinode	5	30	MGW14-04	Confirmed by WAH.
Panicum laevinode	3	45	MGW14-07	
Portulaca filifolia	0.1	15	MGW14-12	
Portulaca oleracea	0.1	20	MGW14-06	
Ptilotus murrayi	1	15	MGW14-05	
Sida fibulifera	0.1	6	MGW14-10	Sens. lat.
Sporobolus australasicus	0.1	10		
Stemodia kingii	0.1	45	MGW14-16	
Trianthema triquetrum	0.1	5	MGW14-13	
Triodia epactia	0.1	45		

MGW-14

Mt Goldsworthy Detailed Flora Survey Site MGW-15

Described by RWLD

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 765640 mE, 7746634 mN

Habitat Sandy / Stony Plain.

Soil Reddish brown sandy loam.

Rock Type Calcrete, Ironstone, Quartz, Shale.

Vegetation Very Open Hummock Grassland of *Triodia epactia* with Low Scattered Shrubs of *Acacia adoxa* var. *adoxa* with Scattered Tall Shrubs of *Acacia inaequilatera.*

Veg Condition Excellent.

Fire Age Recent (0 to 2 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Abutilon lepidum	0.1	20		
Acacia adoxa var. *adoxa*	1	20		
Acacia ancistrocarpa	0.1	150		
Acacia inaequilatera	0.5	220		
Bonamia pilbarensis	0.1	5	MGW15-07, 11	
Bulbostylis barbata	0.1	15	MGW15-08	
Carissa lanceolata	0.1	80		
Crotalaria medicaginea var. *neglecta*	0.1	5		
Dolichocarpa crouchiana	0.1	5		
Dysphania sp.	0.1	1		Inadequate material.
Eriachne pulchella	0.1	5		
Euphorbia clementii	0.1	20	MGW15-14	
Euphorbia vaccaria var. *vaccaria*	0.1	1	MGW15-13	
Goodenia microptera	0.1	4		
Goodenia muelleriana	0.1	20	MGW15-03	
Grevillea pyramidalis subsp. *leucadendron*	0.1	300		
Polygala glaucifolia	0.1	2	MGW15-06	
Portulaca oleracea	0.1	5		
Ptilotus calostachyus	0.1	50		
Senna notabilis	0.1	15		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	10	MGW15-09	
Streptoglossa decurrens	0.1	2	MGW15-05	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	15	MGW15-04, 10	
Trachymene oleracea subsp. *oleracea*	0.1	5		
Tribulus macrocarpus	0.1	5		
Triodia epactia	8	45	MGW15-02	Sens. lat.

MGW-15

Mt Goldsworthy Detailed Flora Survey Site MGW-16

Described by JTMW

Date 28/03/2025

Type Quadrat 25x100m

MGA Zone 50 761812 mE, 7744906 mN

Habitat Medium Drainage Line.

Soil Red sand.

Rock Type None present.

Vegetation Tussock Grassland of *Eulalia aurea*, *Chrysopogon fallax* and *Eriachne benthamii* with a Low Open Woodland of *Eucalyptus victrix* with a High Open Shrubland of *Atalaya hemiglauca*, *Acacia colei*.

Veg Condition Very Good. **Vachellia farnesiana* present.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia colei	1.5	450	MGW02-10=	var. indet.; inadequate material; sterile.
Alternanthera nodiflora	0.1	25	MGW02-04=	
Atalaya hemiglauca	2	420		
Basilicum polystachyon	0.1	65	MGW02-03=	
Blumea tenella	0.1	15	MGW16-09	
Boerhavia burbidgeana	0.1	2	MGW16-05	
Carissa lanceolata	0.1	145		
Centipeda minima subsp. *minima*	0.1	5		
Chrysopogon fallax	20	20		
Cyperus sp.	0.1	50	MGW16-03	? *dactylotes*; inadequate material; sterile.
Cyperus vaginatus	0.1	70		
Dichanthium fecundum	0.1	75	MGW16-01	Sens. lat.
Dichanthium sericeum subsp. *humilius*	0.1	40		
Eragrostis exigua	0.1	60	MGW02-09=	
Eriachne benthamii	20	80	MGW16-02	
Eucalyptus victrix	6	900		
Eulalia aurea	25	80		
Euphorbia fitzroyensis	0.1	1	MGW16-06	
Ipomoea coptica	0.1	15		
Marsilea hirsuta	0.1	4		
Nellica maderaspatensis	0.1	20	MGW16-04	
Neptunia scutata	0.1	5	MGW02-14=	
Portulaca oleracea	0.1	25		
Ptilotus murrayi	0.1	2	MGW14-05=	
Rostellularia adscendens var. *clementii*	0.1	25	MGW16-07	
Sesbania cannabina	0.1	200		
Stemodia kingii	0.1	30	MGW14-16=	
Streptoglossa sp.	0.1	8	MGW16-08	Indet.; inadequate material; Juvenile.
Uvedalia clementii	0.1	10	MGW02-01=	
**Vachellia farnesiana*	0.1	220		N=11.

MGW-16

Mt Goldsworthy Detailed Flora Survey Site MGW-17

Described by JTMW

Date 28/03/2025

Type Quadrat 50x50m

MGA Zone 50 761342 mE, 7745279 mN

Habitat Drainage Area / Floodplain.

Soil Yellowish red medium clay.

Rock Type Ironstone.

Vegetation Very open Tussock Grassland of *Eragrostis xerophila* with an Open hummock Grassland of *Triodia epactia.*

Veg Condition Very Good. **Vachellia farnesiana* present.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Aeschynomene indica	0.1	50	MGW17-06	
Bulbostylis barbata	0.1	15	MGW17-04	
Bulbostylis turbinata	0.1	20	MGW45-06=	
Cyperus iria	0.1	15	MGW17-03A	
Cyperus squarrosus	0.1	25	MGW17-03B	
Dichanthium sericeum subsp. *humilius*	0.1	40		
Eragrostis crateriformis	0.1	35	MGW17-02	
Eragrostis tenellula	0.1	40	MGW04-03=	
Eragrostis xerophila	2	60	MGW03-08=	Sens. lat.
Eriachne glauca var. *glauca*	0.1	35	MGW14-08=	
Ipomoea coptica	0.1	25		
Iseilema sp.	0.1	25	MGW14-03=	
Neptunia scutata	0.1	5	MGW02-14=	
Panicum laevinode	0.1	45	MGW14-07=	
Paspalidium rarum	0.1	25	MGW17-05	
Portulaca oleracea	0.1	20	MGW14-06=	
Ptilotus murrayi	0.1	15	MGW14-05=	
Rhynchosia minima	0.1	25		
Senna artemisioides subsp. *oligophylla*	0.1	40	MGW17-01	(thinly sericeous form MET 15,035).
Sporobolus australasicus	0.1	10		
Streptoglossa decurrens	0.1	5		
Triodia epactia	25	45		
**Vachellia farnesiana*	0.1	200		N=1.

MGW-17

Mt Goldsworthy Detailed Flora Survey Site MGW-18

Described by JTMW

Date 28/03/2025

Type Quadrat 50x50m

MGA Zone 50 761461 mE, 7745357 mN

Habitat Sandy / Stony Plain.

Soil Dark red sand.

Rock Type None present.

Vegetation Open Hummock Grassland of *Triodia epactia* with an Open Shrubland of *Acacia stellaticeps* with Scattered Low Trees of *Corymbia hamersleyana* and *Eucalyptus victrix* with Scattered Herbs of *Boerhavia burbidgeana.*

Veg Condition Excellent. Minor signs of cattle.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia stellaticeps	9	120	MGW-JT04=	
Afrohybanthus aurantiacus	0.1	35		
Aristida holathera var. *holathera*	0.1	50		
Aristida hygrometrica	0.1	55	MGW13-21=	
Arivela viscosa	0.1	40		
Boerhavia burbidgeana	0.5	2	MGW16-05=	
Bonamia oblongifolia	0.1	25	MGW18-02	Confirmed by WAH.
Bonamia pannosa	0.1	20		
Bulbostylis barbata	0.1	10	MGW17-04=	
Carissa lanceolata	0.1	160		
Chrysopogon fallax	0.1	60		
Commelina ensifolia	0.1	15		
Corchorus sp.	0.1	15		
Corymbia hamersleyana	0.5	600		
Eragrostis cumingii	0.1	35		
Eragrostis eriopoda	0.1	65	MGW08-07=	
Eriachne aristidea	0.1	30	MGW18-04	
Eriachne obtusa	0.1	50		
Eucalyptus victrix	0.5	850		
Gomphrena a[inis subsp. *pilbarensis*	0.1	45	MGW18-05	
Goodenia microptera	0.1	15		
Grona muelleri	0.1	25	MGW45-12=	
Indigofera colutea	0.1	10		
Indigofera linifolia	0.1	25		
Indigofera linnaei	0.1	35		
Ipomoea coptica	0.1	25		
Lysiphyllum cunninghamii	0.1	60		
Panicum australiense var. *australiense*	0.1	10	MGW-JT03=	
Panicum laevinode	0.1	45	MGW14-07=	
Paspalidium rarum	0.1	25	MGW17-05=	
Perotis rara	0.1	25		
Pluchea tetranthera	0.1	35	MGW18-06	
Polymeria sp.	0.1	20	MGW18-03	? *mollis*; inadequate material; sterile.
Portulaca filifolia	0.1	25	MGW14-12=	

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Portulaca oleracea	0.1	3		
Ptilotus fusiformis	0.1	50		
Ptilotus murrayi	0.1	5	MGW14-05=	
Rhynchosia minima	0.1	30		
Senna notabilis	0.1	15		
Trianthema pilosum	0.1	20		
Tribulopis angustifolia	0.1	20	MGW13-07=	
Trigastrotheca molluginea	0.1	5		
Triodia epactia	11	60		
Triodia schinzii	0.1	55	MGW18-01	

MGW-18

Mt Goldsworthy Detailed Flora Survey Site MGW-19

Described by RWLD

Date 28/03/2025

Type Quadrat 25x100m

MGA Zone 50 762913 mE, 7744157 mN

Habitat Medium Drainage Line.

Soil Reddish brown clay loam.

Rock Type None present.

Vegetation Tussock Grassland of *Eulalia aurea*, (*Chrysopogon fallax, Eriachne benthamii*) with a High Shrubland of *Acacia synchronicia* with a Low Open Woodland of *Eucalyptus victrix* with Scattered Herbs of *Marsilea hirsuta* with Scattered Sedges of *Cyperus vaginatus* with Scattered Shrubs of **Vachellia farnesiana.*

Veg Condition Very Good. **Vachellia farnesiana* present.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia colei	0.1	210		var. indet.; inadequate material; sterile.
Acacia synchronicia	15	250		
Alternanthera nodiflora	0.1	15		
Ammannia multiflora	0.1	20	MGW19-14	
Basilicum polystachyon	0.1	20	MGW19-13A	
Bergia pedicellaris	0.1	5	MGW19-15	
Blumea tenella	0.1	15	MGW19-17	
Boerhavia burbidgeana	0.1	5	MGW19-09	
Centipeda minima subsp. *minima*	0.1	2	MGW19-13	Inadequate material.
Chrysopogon fallax	10	110		
Corchorus tridens	0.1	5	MGW19-22	
Cynodon convergens	0.1	10	MGW19-24	
Cyperus squarrosus	0.1	5		
Cyperus vaginatus	1	60		
Dichanthium sericeum subsp. *humilius*	0.1	15	MGW19-02	
Eriachne benthamii	5	80	MGW19-04	
Eucalyptus victrix	12	850		
Eulalia aurea	35	90		
Euphorbia fitzroyensis	0.1	5	MGW19-01, 16, 20	
Fimbristylis microcarya	0.1	25	MGW19-06, 07	
Grona filiformis	0.1	5	MGW10-06=	
Ipomoea coptica	0.1	10		
Iseilema macratherum	0.1	5	MGW19-11	Sens. lat.
Ludwigia perennis	0.1	40	MGW19-05	
Marsilea hirsuta	0.5	15		
Mimulus gracilis	0.1	5	MGW19-12	
Nellica maderaspatensis	0.1	20	MGW19-03	
Neptunia xanthonema	0.1	5	MGW19-18	
Operculina aequisepala	0.1	10		
Peplidium muelleri	0.1	5	MGW19-10	

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Pluchea rubelliflora	0.1	20		
Portulaca filifolia	0.1	5	MGW19-21	
Portulaca oleracea	0.1	10		
Ptilotus murrayi	0.1	5		
Rostellularia adscendens var. *clementii*	0.1	15	MGW-RW08=	
Sesbania cannabina	0.1	40		
Sporobolus australasicus	0.1	20		
Trianthema triquetrum	0.1	1	MGW19-23	
**Vachellia farnesiana*	0.5	180		N=20.
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	25	MGW19-19	

MGW-19

Mt Goldsworthy Detailed Flora Survey Site MGW-20

Described by RWLD

Date 28/03/2025

Type Quadrat 50x50m

MGA Zone 50 76285 mE, 7745786 mN

Habitat Sandy / Stony Plain.

Soil Reddish brown sandy loam.

Rock Type None present.

Vegetation Low Open Woodland of *Corymbia hamersleyana* and *Corymbia flavescens* with a Very Open Hummock Grassland of *Triodia epactia* with Scattered Herbs of *Boerhavia gardneri* and *Trianthema pilosa* with Scattered Tussock Grass of *Aristida hygrometrica* and **Cenchrus ciliaris* with Low Scattered Shrubs of *Grevillea wickhamii* and *Acacia acradenia.*

Veg Condition Very Good. **Cenchrus ciliaris* present.

Fire Age Recent (0 to 2 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Abutilon otocarpum	0.1	15		
Acacia acradenia	0.5	60	MGW20-10	
Acacia colei	0.1	120		var. indet.; inadequate material; sterile.
Afrohybanthus aurantiacus	0.1	30	MGW20-19	
Aristida hygrometrica	0.5	40	MGW20-07	
Arivela viscosa	0.1	45		
Boerhavia gardneri	1	15	MGW20-08	Confirmed by WAH; inadequate material; sterile.
Bonamia sp.	0.1	20	MGW20-04	? *linearis*
Bonamia sp.	0.1	20	MGW20-04B	? *linearis*; inadequate material.
Bonamia erecta	0.1	25		
Bonamia pannosa	0.1	15	MNR04=	
**Cenchrus ciliaris*	0.5	40		
Chrysopogon fallax	0.1	45		
Corchorus sidoides subsp. *vermicularis*	0.1	30	MGW20-05	
Corchorus tridens	0.1	5		
Corymbia flavescens	2	700	MGW20-01	
Corymbia hamersleyana	5	500		
Cullen martinii	0.1	5	MGW20-23	
Dampiera candicans	0.1	40		
Eragrostis eriopoda	0.5	35	MGW20-09	
Eriachne aristidea	0.1	40		
Eriachne obtusa	0.1	40	MGW20-13	
Euphorbia trigonosperma	0.1	40	MGW20-03	
Euphorbia vaccaria var. *vaccaria*	0.1	1	MGW20-17	
Fimbristylis ammobia	0.1	10	MGW20-11	
Goodenia microptera	0.1	5		
Grevillea wickhamii	0.5	100		Sterile.
Grona filiformis	0.1	10	MGW10-06=	
Hibiscus leptocladus	0.1	40	MGW20-25	Sens. lat.
Hibiscus sturtii var. *campylochlamys*	0.1	25	MGW20-06	
Isotropis atropurpurea	0.1	20		

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Notoleptopus decaisnei	0.1	30	MGW20-20	
Panicum australiense var. *australiense*	0.1	5	MGW20-14	
Portulaca sp.	0.1	20		*P. pilosa / decipiens*; inadequate material.
Ptilotus axillaris	0.1	5		
Ptilotus fusiformis	0.1	10		
Rhynchosia minima	0.1	15		
Senna notabilis	0.1	40		
Sida rohlenae subsp. *rohlenae*	0.1	40	MGW20-02A	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	30	MGW20-15	
Sida sp. Pindan (B.G. Thomson 3398)	0.1	20	MGW20-12	
Sida sp. Rabbit Flat (B.J. Carter 626)	0.1	40	MGW20-02	Confirmed by WAH.
Solanum diversiflorum	0.1	5	MGW20-22	
Solanum sp.	0.1	5	MGW20-24	*S. perarmatum / cleistogamum;* indet.; inadequate material; sterile.
Sporobolus australasicus	0.1	30		
Tephrosia rosea var. *clementii*	0.1	20	MGW20-16	
Trianthema pilosum	0.5	15		
Tribulopis angustifolia	0.1	25	MNLD02-04=	
Trigastrotheca molluginea	0.1	5		
Triodia epactia	4	45	MGW20-21	Sens. lat.

MGW-20

Mt Goldsworthy Detailed Flora Survey Site MGW-21

Described by RWLD

Date 29/03/2025

Type Quadrat 50x50m

MGA Zone 50 764700 mE, 7746096 mN

Habitat Sandy / Stony Plain.

Soil Reddish brown sandy loam.

Rock Type Ironstone, Quartz.

Vegetation Hummock Grassland of *Triodia wiseana*, (*T. epactia*) with a High Open Shrubland of *Acacia acradenia.*

Veg Condition Excellent.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	5.5	205	MGW21-02	
Acacia ancistrocarpa	0.1	160		
Aristida holathera var. *holathera*	0.1	25		
Bonamia erecta	0.1	15		
Bonamia pannosa	0.1	10	MGW21-05	
Bulbostylis barbata	0.1	10		
Corchorus sp.	0.1	15	MGW21-04	*C.* ? *sidoides* subsp. *vermicularis*; inadequate material; sterile.
Crotalaria medicaginea var. *neglecta*	0.1	15		
Dolichocarpa crouchiana	0.1	5		
Eriachne pulchella	0.1	15		
Euphorbia clementii	0.1	25	MGW10-11=	
Grevillea pyramidalis subsp. *leucadendron*	0.1	110		
Grevillea wickhamii	0.1	205		Sterile.
Panicum australiense var. *australiense*	0.1	5	MGW21-01	
Polygala glaucifolia	0.1	2	MGW21-03	
Ptilotus axillaris	0.1	5		
Tribulus macrocarpus	0.1	10		
Trigastrotheca molluginea	0.1	10		
Triodia epactia	0.5	40		
Triodia wiseana	35	50	MGWLD07=	

MGW-21

Mt Goldsworthy Detailed Flora Survey Site MGW-22

Described by RWLD

Date 28/03/2025

Type Quadrat 50x50m

MGA Zone 50 764737 mE, 7745717 mN

Habitat Sandy / Stony Plain.

Soil Red sand.

Rock Type None present.

Vegetation Low Open Woodland of *Corymbia hamersleyana* with an Open Hummock Grassland of *Triodia epactia* and *Triodia schinzii* with an Open Shrubland of *Acacia acradenia*, *Acacia ancistrocarpa* and *Acacia stellaticeps* with Scattered Tussock Grass of **Cenchrus ciliaris.*

Veg Condition Very Good. Weeds present.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	2	200	MGW21-02=	
Acacia ancistrocarpa	2	200		
Acacia colei	0.1	120		var. indet.; inadequate material, sterile.
Acacia stellaticeps	0.5	110	MGW22-21	
Afrohybanthus aurantiacus	0.1	35		
Aristida holathera var. *holathera*	0.1	35		
Arivela uncifera	0.1	25	MGW-RW04=	
Arivela viscosa	0.1	30	MGW22-15A	
Boerhavia coccinea	0.1	5	MGW22-06	
Bonamia alatisemina	0.1	5	MGW22-12	
Bonamia erecta	0.1	20		
Bonamia pannosa	0.1	30	MNR04=	
Bulbostylis barbata	0.1	15		
Carissa lanceolata	0.1	180		
**Cenchrus ciliaris*	1.5	60		
Chrysopogon fallax	0.1	40		
Corchorus sidoides subsp. *vermicularis*	0.1	25	MGW22-11	Inadequate material; sterile.
Corymbia hamersleyana	20	50	MGW22-01	
Crotalaria medicaginea var. *neglecta*	0.1	30		
Crotalaria ramosissima	0.1	15	MGW22-07	
Cucumis sp.	0.1	20		Inadequate material.
Dampiera candicans	0.1	15		
Dodonaea coriacea	0.1	40	MGW22-19	
Eragrostis eriopoda	0.1	30	MGW22-04	
Euphorbia trigonosperma	0.1	15	MGW22-09	
Euphorbia vaccaria var. *vaccaria*	0.1	5	MGW22-05	
Euploca diversifolia	0.1	5	MGW22-13	
Evolvulus alsinoides var. *decumbens*	0.1	30		
Goodenia microptera	0.1	30		
Grevillea wickhamii	0.1	80		Sterile.
Grona filiformis	0.1	10	MGW10-06=	
Hibiscus sturtii var. *campylochlamys*	0.1	30	MGW22-20	

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Indigofera linifolia	0.1	5		
Isotropis atropurpurea	0.1	20		
Neurachne muelleri	0.1	30		
Notoleptopus decaisnei	0.1	10	MGW22-16	
Panicum australiense var. *australiense*	0.1	15	MGW22-03	
Polymeria sp.	0.1	5	MGW22-14	? *mollis*; inadequate material; sterile.
Polymeria ambigua	0.1	5	MGW22-17	*Polymeria* sp. (Site 1365) PL de Kock ID.
Ptilotus astrolasius	0.1	30	MGW22-18	
Ptilotus fusiformis	0.1	25		
Senna notabilis	0.1	25		
Sida rohlenae subsp. *rohlenae*	0.1	25	MGW22-23	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	30	MGW22-08	
Solanum diversiflorum	0.1	25		
Solanum sp.	0.1	5	MGW22-10	*S. perarmatum* / *cleistogamum*; indet.; inadequate material; sterile; Juvenile.
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	5	MGW22-15B	
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0.1	5	MGW22-22	
Trianthema pilosum	0.1	15		
Tribulus macrocarpus	0.1	5		
Trigastrotheca molluginea	0.1	25		
Triodia epactia	9	45		
Triodia schinzii	2	50	MGW22-02	
**Vachellia farnesiana*	0.1	60		N=1.

MGW-22

Mt Goldsworthy Detailed Flora Survey Site MGW-23

Described by JTMW

Date 29/03/2025

Type Quadrat 50x50m

MGA Zone 50 766009 mE, 7745152 mN

Habitat Sandy / Stony Plain.

Soil Dark red loamy sand.

Rock Type None present.

Vegetation Open Hummock Grassland of *Triodia epactia* with a Low Open Shrubland of *Acacia colei, Acacia acradenia* and *Carissa lanceolata*.

Veg Condition Excellent.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	4	110	MGW-JT11=	
Acacia ancistrocarpa	7	260		
Acacia colei	4	175		var. indet.
Acacia inaequilatera	7	360		
Aristida contorta	0.1	25		
Aristida holathera var. *holathera*	0.1	30		
Arivela viscosa	0.1	65		
Boerhavia coccinea	0.1	15	MGW05-03=	
Bonamia media	0.1	12	MGW23-01	
Bonamia pannosa	0.1	20		
Bulbostylis barbata	0.1	10	MGW13-02=	
Capparis lasiantha	0.1	70	MGW23-05	
Carissa lanceolata	1	150		
Chrysopogon fallax	0.1	80		
Corchorus sp.	0.1	5		Inadequate material; sterile.
Cullen sp.	0.1	30	MGW04-05=	*C.* ? *pogonocarpum.*
Dactyloctenium radulans	0.1	15		
Eragrostis crateriformis	0.1	25	MGW23-03	
Eriachne aristidea	0.1	25	MGW18-04=	
Euphorbia vaccaria var. *vaccaria*	0.1	15	MGW23-06, 09	
Evolvulus alsinoides var. *villosicalyx*	0.1	15		
Goodenia microptera	0.1	8		
Gossypium australe	0.1	25		
Grevillea pyramidalis subsp. *leucadendron*	0.1	170		
Hibiscus sturtii var. *grandiflorus*	0.1	50	MGW23-08	
Paspalidium clementii	0.1	20	MGW23-11	
Polycarpaea corymbosa var. *corymbosa*	0.1	10		
Polymeria mollis	0.1	40	MGW23-02	Inadequate material; Sterile.
Portulaca oleracea	0.1	25		
Ptilotus axillaris	0.1	15	MGW13-09=	
Senna artemisioides subsp. *oligophylla*	0.1	80	MGW23-07	(thinly sericeous form MET 15,035).
Senna notabilis	0.1	25		

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	75	MGW23-10	
Sporobolus australasicus	0.1	25		
Tephrosia sp.	0.1	20	MGW23-04	? sp. Northern (K.F. Kenneally 11950); inadequate material; sterile; Atypically long petiole.
Tribulus hirsutus	0.1	15		
Trigastrotheca molluginea	0.1	5		
Triodia epactia	28	60		

MGW-23

Mt Goldsworthy Detailed Flora Survey Site MGW-24

Described by JTMW

Date 29/03/2025

Type Quadrat 50x50m

MGA Zone 50 762502 mE, 7745104 mN

Habitat Gilgai Plain.

Soil Reddish brown light to medium clay.

Rock Type None present.

Vegetation Tussock Grassland of *Eriachne benthamii, Eragrostis xerophila* and *Dichanthium sericeum* subsp. *humilius.*

Veg Condition Excellent.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Bulbostylis turbinata	0.1	20	MGW45-06=	
Dichanthium sericeum subsp. *humilius*	22	50		
Eragrostis tenellula	0.1	40	MGW24-03	
Eragrostis xerophila	23	65		
Eriachne benthamii	23	65	MGW24-01	
Eriachne glauca var. *glauca*	0.1	20	MGW24-04	
Ipomoea coptica	0.1	20		
Iseilema macratherum	1	25	MGW24-02	Sens. lat.
Marsilea hirsuta	0.1	5		
Mimulus gracilis	0.1	10	MGW24-05	Floodplain.
Nellica maderaspatensis	0.1	20	MGW24-07	
Neptunia scutata	0.1	25	MGW02-14=	
Panicum laevinode	0.1	30	MGW24-08	Confirmed by WAH.
Ptilotus murrayi	0.1	5	MGW14-05=	
Sesbania cannabina	0.1	80		
Stemodia kingii	0.1	35	MGW14-16=	
Streptoglossa sp.	0.1	20	MGW24-06	Indet.; Floodplain; inadequate material.

MGW-24

Mt Goldsworthy Detailed Flora Survey Site MGW-25

Described by JTMW

Date 29/03/2025

Type Quadrat 50x50m

MGA Zone 50 762338 mE, 7745459 mN

Habitat Sandy / Stony Plain.

Soil Dark red sand.

Rock Type None present.

Vegetation Open Hummock Grassland of *Triodia epactia* with an Open Shrubland of *Acacia stellaticeps* with a Very Open Tussock Grassland of *Eragrostis eriopoda* with Scattered Tall Shrubs of *Acacia inaequilatera* with Scattered Herbs of *Bonamia erecta* and *Boerhavia burbidgeana* with Scattered Low Trees of *Corymbia hamersleyana.*

Veg Condition Excellent.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code
Acacia acradenia	0.1	80	MGW-JT02=
Acacia inaequilatera	1	280	
Acacia stellaticeps	9	120	MGW-JT04=
Afrohybanthus aurantiacus	0.1	40	
Aristida holathera var. *holathera*	0.1	55	
Arivela uncifera	0.1	25	MGW25-03
Arivela viscosa	0.1	35	
Boerhavia burbidgeana	0.5	10	MGW16-05=
Bonamia erecta	0.5	30	
Bonamia pannosa	0.1	55	
Bulbostylis barbata	0.1	10	MGW17-04=
Carissa lanceolata	0.1	75	
Chrysopogon fallax	0.1	150	
Corymbia hamersleyana	1	300	
Eragrostis eriopoda	5	75	MGW08-07=
Eriachne obtusa	0.1	65	
Euphorbia trigonosperma	0.1	25	MGW25-04
Evolvulus alsinoides var. *villosicalyx*	0.1	20	
Goodenia microptera	0.1	25	
Grona muelleri	0.1	10	MGW45-12=
Hakea lorea subsp. *lorea*	0.1	95	
Indigofera linifolia	0.1	45	
Isotropis atropurpurea	0.1	25	MGW25-02
Notoleptopus decaisnei	0.1	20	MGW09-04=
Panicum australiense var. *australiense*	0.1	5	
Polymeria mollis	0.1	20	MGW23-02=
Senna notabilis	0.1	30	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	50	MGW23-10=
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0.1	25	MGW25-01
Trianthema pilosum	0.1	20	
Tribulopis angustifolia	0.1	5	MGW13-07=
Tribulus hirsutus	0.1	5	
Trigastrotheca molluginea	0.1	5	
Triodia epactia	27	65	
Triodia schinzii	0.1	60	MGW18-01=

MGW-25

Mt Goldsworthy Detailed Flora Survey Site MGW-26

Described by JTMW

Date 27/03/2025

Type Quadrat 50x50m

MGA Zone 50 764999 mE, 7746020 mN

Habitat Sandy / Stony Plain.

Soil Dark reddish brown sand.

Rock Type Ironstone.

Vegetation Open Hummock Grassland of *Triodia epactia* with Scattered Tall Shrubs of *Acacia acradenia* with Scattered Low Trees of *Corymbia hamersleyana.*

Veg Condition Very Good. Signs of cattle.

Fire Age Moderate (3 -5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia acradenia	1.5	250	MGW26-01	
Afrohybanthus aurantiacus	0.1	35		
Aristida holathera var. *holathera*	0.1	45		
Bonamia erecta	0.1	25		
Bonamia media	0.1	5	MGW04-10=	
Bonamia pannosa	0.1	20		
Bulbostylis barbata	0.1	5	MGW04-09=	
Corchorus sp.	0.1	30	MGW26-02	? *sidoides* subsp. *vermicularis.*
Corymbia hamersleyana	0.5	430		
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	60		
Dampiera candicans	0.1	20	MGW26-03	
Eriachne obtusa	0.1	50		
Eriachne pulchella	0.1	15		
Euphorbia clementii	0.1	40	MGW08-02=	
Euploca sp.	0.1	5	MGW08-08=	? *pachyphylla*; inadequate material; sterile.
Goodenia microptera	0.1	15		
Grevillea pyramidalis subsp. *leucadendron*	0.1	205		
Grevillea wickhamii	0.1	250		Sterile.
Isotropis atropurpurea	0.1	25		
Neurachne muelleri	0.1	30		
Notoleptopus decaisnei	0.1	15	MGW09-04=	
Panicum australiense var. *australiense*	0.1	25		
Petalostylis labicheoides	0.1	90		
Polygala glaucifolia	0.1	3	MGW13-03=	
Ptilotus axillaris	0.1	10	MGW13-09=	
Senna notabilis	0.1	25		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	15	MGW08-04=	
Solanum lasiophyllum	0.1	25		
Trianthema pilosum	0.1	15	MGW13-20=	
Tribulus hirsutus	0.1	10		
Trigastrotheca molluginea	0.1	10		
Triodia epactia	12	55		

MGW-26

Mt Goldsworthy Detailed Flora Survey Site MGW-27

Described by JTMW

Date 27/03/2025

Type Quadrat 25x100m

MGA Zone 50 764808 mE, 7746220 mN

Habitat Sandy / Stony Plain.

Soil Dark reddish brown loam.

Rock Type Basalt, Ironstone.

Vegetation Hummock Grassland of *Triodia wiseana*.

Veg Condition Excellent.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia inaequilatera	0.1	170		
Arivela viscosa	0.1	15		
Bonamia pilbarensis	0.1	10	MGW-MW01=	Port Hedland Form.
Corchorus parviflorus	0.1	4	MGW27-05	Inadequate material; sterile.
Crotalaria medicaginea var. *neglecta*	0.1	30		
Dolichocarpa crouchiana	0.1	2		
Eriachne pulchella	0.1	10		
Euphorbia clementii	0.1	15	MGW27-01	
Euploca sp.	0.1	3	MGW08-08=	? *pachyphylla;* inadequate material; sterile.
Gomphrena cunninghamii	0.1	5	MGW27-03	
Goodenia microptera	0.1	5		
Panicum australiense var. *australiense*	0.1	5	MGW27-07	
Polygala glaucifolia	0.1	5	MGW27-04	
Ptilotus clementii	0.1	5		
Senna notabilis	0.1	25		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	10	MGW12-04=	
Swainsona sp.	0.1	25	MGW27-06	? *maccullochiana*; inadequate material; juvenile.
Tribulus sp.	0.1	15	MGW27-02	? *hirsutus*; inadequate material; sterile.
Triodia wiseana	35	60		

MGW-27

Mt Goldsworthy Detailed Flora Survey Site MGW-45

Described by JTMW

Date 26/03/2025

Type Quadrat 50x50m

MGA Zone 50 765579 mE, 7744690 mN

Habitat Gilgai Plain.

Soil Red light clay.

Rock Type Ironstone.

Vegetation Closed Tussock Grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *humilius*, (*Sporobolus australasicus*) with Scattered Herbs of *Ipomoea coptica* and *Streptoglossa tenuiflora*.

Veg Condition Excellent.

Fire Age Old (6+ yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Arivela viscosa	0.1	45		
Bulbostylis turbinata	0.1	28	MGW45-06	
Corchorus tridens	0.1	25	MGW45-05	
Cynodon convergens	0.1	45		
Cyperus iria	0.1	55	MGW03-16=	
Dactyloctenium radulans	0.1	5		
Dichanthium sericeum subsp. *humilius*	31	45	MGW45-02	
Eragrostis xerophila	31	55	MGW45-01	
Eriachne glauca var. *glauca*	0.1	25	MGW02-15=	
Euphorbia trigonosperma	0.1	25	MGW45-08	Sens. lat.
Grona muelleri	0.1	20	MGW45-12	Inadequate material; sterile.
Indigofera linifolia	0.1	30		
Indigofera trita subsp. *trita*	0.1	25	MGW45-10	
Ipomoea coptica	1	25		
Iseilema dolichotrichum	1	25	MGW45-03	
Neptunia scutata	0.1	5	MGW02-14=	
Polygala isingii	0.1	5	MGW45-07	
Portulaca sp.	0.1	15	MGW45-04	(*oleracea/ intraterranea*); inadequate material.
Ptilotus murrayi	0.1	10	MGW45-09	
Rhynchosia minima	0.1	5		
Sida fibulifera	0.1	25	MGW45-11	Sens. lat.
Sporobolus australasicus	10	15		
Streptoglossa sp.	0.5	10	MGW45-13	? *tenuiflora*; Submitted to WAH; inadequate material; sterile.
Streptoglossa bubakii	0.1	20		

MGW-45

Mt Goldsworthy Detailed Flora Survey Site MGW-R01

Described by RWLD

Date 26/03/2025

Type Relevé 50x50m

MGA Zone 50 765104 mE, 7745544 mN

Habitat Sandy / stony plain.

Soil Sandy loam.

Rock Type Ironstone.

Vegetation Very Open Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Corymbia hamersleyana*.

Veg Condition Excellent.

Fire Age Recent (0 to 2 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia inaequilatera	0.1	125		
Arivela viscosa	0.1	10		
Bonamia pilbarensis	0.1	1	MGW-R01-08	
Bulbostylis barbata	0.1	5		
Corchorus elachocarpus	0.1	10	MGW-R01-05	
Corymbia hamersleyana	0.5	200		
Dolichocarpa crouchiana	0.1	10		
Euphorbia clementii	0.1	15	MGW-R01-02	
Euphorbia vaccaria var. *vaccaria*	0.1	1	MGW-R01-07	
Goodenia muelleriana	0.1	30	MGW-R01-04	
Grevillea pyramidalis subsp. *leucadendron*	0.1	200		
Grevillea wickhamii	0.1	180		Sterile.
Notoleptopus decaisnei	0.1	5		
Panicum australiense var. *australiense*	0.1	5	MGW-R01-06	
Ptilotus auriculifolius	0.1	20	MGW-R01-03	
Solanum sp.	0.1	1		*S. perarmatum / cleistogamum*; indet.
Tribulus hirsutus	0.1	5	MGW-R01-01	
Tribulus platypterus	0.1	25	MGW-R01-10	
Trigastrotheca molluginea	0.1	5		
Triodia epactia	9	60		

MGW-R01

Mt Goldsworthy Detailed Flora Survey Site MGW-R02

Described by RWLD

Date 28/03/2025

Type Relevé 50x50m

MGA Zone 50 764013 mE, 7745636 mN

Habitat Sandy / stony plain.

Soil Sandy loam.

Rock Type None present.

Vegetation Low Woodland of *Corymbia hamersleyana* with an Open Tussock Grassland of *Eragrostis eriopoda* and *Eriachne obtusa* with a Very Open Hummock Grassland of *Triodia epactia* with Scattered Herbs of *Bonamia erecta*.

Veg Condition Very Good. **Cenchrus ciliaris* present.

Fire Age Moderate (3 to 5 yr).

Species	Cover (%)	Height (cm)	Specimen Code	Notes
Acacia ancistrocarpa	0.1	200		
Afrohybanthus aurantiacus	0.1	30		
Aristida holathera var. *holathera*	0.1	25		
Arivela uncifera	0.1	30	MGW-RW04=	
Arivela viscosa	0.1	40		
Boerhavia ? *gardneri*	0.1	15		
Bonamia erecta	0.5	40		
Bonamia pannosa	0.1	20	MNR04=	
Bulbostylis barbata	0.1	5		
Carissa lanceolata	0.1	160		
**Cenchrus ciliaris*	0.1	50		
Chrysopogon fallax	0.1	110		
Corymbia flavescens	22	900	MGW-R02-01	
Corymbia hamersleyana	0.1	400		
Crotalaria ramosissima	0.1	20	MGW22-07=	
Cucumis sp.	0.1	30		Inadequate material.
Eragrostis eriopoda	10	30	MGW11-01=	
Eriachne obtusa	10	35	MGW20-13=	
Grevillea wickhamii	0.1	180		Sterile.
Grona filiformis	0.1	10	MGW10-06=	
Hakea lorea subsp. *lorea*	0.1	200		
Hibiscus sturtii var. *campylochlamys*	0.1	30	MGW-R02-04	
Paspalidium rarum	0.1	25	MGW-R02-05	
Polymeria ambigua	0.1	10		
Ptilotus fusiformis	0.1	40		
Senna notabilis	0.1	30		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	30	MGWR02-04B	
Sporobolus australasicus	0.1	5		
Tephrosia rosea var. *clementii*	0.1	40	MGW-R02-03	
Trianthema pilosum	0.1	5		
Tribulopis angustifolia	0.1	5	MNLD02-04=	
Trigastrotheca molluginea	0.1	5		
Triodia epactia	2.5	50		

MGW-R02

Appendix 7

Selected Inputs and Outputs from the Floristic Analysis

Site	MGW01	MGW02	MGW03	MGW04	MGW05	MGW06	MGW07	MGW08
Floristic Group 32% similarity	c	b	c	f	f	a	f	e
Vegetation Association	Te Ev ChfErbErx	Ev AsyAcoAthe EuaErbChf Cyv	Te Ev ChfErbErx	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	ErxErbErgg DishErte	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz
Species								
Abutilon otocarpum	0	0	0	0	0.1	0	0	0.1
Acacia acradenia	0	0	0	0	0.25	0	0	0
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0	0
Acacia ancistrocarpa	0	0	0	0	3	0	0	5
Acacia colei var. indet	0	0.1	0	0.1	0.1	0	0.5	0
Acacia inaequilatera	0	0	0	0.5	0.1	0	0	0.25
Acacia sericophylla	0	0	0	0	0	0	0	0
Acacia stellaticeps	0	0	0	0	0	0	0	0
Acacia synchronicia	0	0	0	1.25	0	0	0.5	0
Afrohybanthus aurantiacus	0	0.1	0	0	0.1	0	0	0.1
Alternanthera nodiflora	0	0.1	0	0	0	0	0	0
Ammannia multiflora	0	0.1	0	0	0	0.1	0	0
Aristida holathera var. *holathera*	0	0	0	0.1	0	0	0	0.1
Aristida hygrometrica	0	0	0	0	0	0	0	0
Arivela uncifera	0	0	0	0	0.1	0	0	0.1
Arivela viscosa	0	0	0	0	2	0	0.1	0.1
Atalaya hemiglauca	0	4	0	0	0	0	0	0
Basilicum polystachyon	0	0.1	0	0	0	0	0	0
Bergia pedicellaris	0	0	0	0	0	0.1	0	0
Blumea tenella	0	0	0	0	0	0.1	0	0
Boerhavia burbidgeana	0	0.1	0	0	0	0	0	0
Boerhavia coccinea	0	0	0	0	0.1	0	0	0.1
Boerhavia gardneri	0	0	0	0	0	0	0	0
Bonamia erecta	0	0	0	0	0	0	0	0.1
Bonamia linearis	0	0	0	0	0	0	0	0.1
Bonamia media	0	0	0	0.1	0.1	0	0	0.1
Bonamia pannosa	0	0	0	0.1	0.1	0	0.1	0.1
Bonamia pilbarensis	0	0	0	0	0	0	0	0
Bulbostylis barbata	0.1	0	0	0.1	0.1	0	0.1	0.1
Bulbostylis turbinata	0	0.1	0.1	0	0	0	0	0
Carissa lanceolata	0	0.5	0	0	0	0	0	0.1
Centipeda minima subsp. *minima*	0	0.1	0	0	0	0	0	0
Chloris pectinata	0.1	0	0.1	0	0	0	0	0
Chrysopogon fallax	3	15	7	0.1	0	0	0.5	0.1
Commelina ensifolia	0.1	0	0	0	0	0	0	0
Corchorus elachocarpus	0	0	0	0	0.1	0	0	0
Corchorus parviflorus	0	0	0	0	0	0	0	0
Corchorus sidoides subsp. *vermicularis*	0	0	0	0	0	0	0	0
Corchorus tridens	0.1	0	0.1	0.1	0	0.1	0	0
Corymbia flavescens	0	0	0	0	0	0	0	0
Corymbia hamersleyana	0	0	0	0	0	0	0	1.5
Corymbia zygophylla	0	0	0	0	0	0	0	0
Crotalaria medicaginea var. *neglecta*	0	0	0	0	0	0	0	0
Crotalaria ramosissima	0	0	0	0	0.1	0	0	0
Cucumis variabilis	0	0	0	0	0.1	0	0	0
Cullen martinii	0	0	0	0	0	0	0	0.1
Cynodon convergens	0	0	0	0	0	0	0	0
Cyperus bulbosus	0.1	0	0	0	0	0	0	0
Cyperus iria	0	0	0.1	0	0	0.1	0.1	0
Cyperus squarrosus	0	0	0	0	0	0	0	0
Cyperus vaginatus	0	1.5	0	0	0	0	0	0
Dactyloctenium radulans	0.1	0	0	0.1	0.1	0	0.1	0
Dampiera candicans	0	0	0	0	0	0	0	0
Dichanthium sericeum subsp. *humilius*	0.1	0	3	0.1	0	3	0	0
Dodonaea coriacea	0	0	0	0	0	0	0	0
Dolichocarpa crouchiana	0	0	0	0	0	0	0	0
Eragrostis crateriformis	0	0	0	0.1	0	0	0	0

Site	MGW01	MGW02	MGW03	MGW04	MGW05	MGW06	MGW07	MGW08
Eragrostis cumingii	0.1	0	0	0	0	0	0	0
Eragrostis eriopoda	0	0	0	0	0	0	0	0.1
Eragrostis exigua	0	0.1	0	0	0	0	0	0
Eragrostis tenellula	0	0	0	0.1	0	3	0.1	0
Eragrostis xerophila	1	0	5	0	0	60	0	0
Eriachne aristidea	0	0	0	0	0	0	0.1	0
Eriachne benthamii	0	5	5	0	0	0	0	0
Eriachne glauca var. *glauca*	0	0.1	0	0.1	0	5	0.1	0
Eriachne obtusa	0	0	0	0	0	0	0	0.1
Eriachne pulchella	0	0	0	0	0	0	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0	0	0	0	0	0
Eucalyptus odontocarpa	0	0	0	0	0	0	0	0
Eucalyptus victrix	1	17	0.5	0	0	0	0	0
Eulalia aurea	0	40	2	0.1	0	0	0	0
Euphorbia clementii	0	0	0	0	0	0	0	0.1
Euphorbia fitzroyensis	0	0.1	0.1	0	0	0	0	0
Euphorbia inappendiculata var. *inappendiculata*	0.1	0	0.1	0	0	0	0	0
Euphorbia trigonosperma	0.1	0	0	0	0	0	0	0
Euphorbia vaccaria var. *vaccaria*	0	0	0	0.1	0	0	0	0.1
Evolvulus alsinoides var. *villosicalyx*	0	0	0	0.1	0	0	0.1	0
Fimbristylis ammobia	0	0	0	0	0	0	0	0
Fimbristylis dichotoma	0.1	0	0.1	0	0	0	0	0
Fimbristylis simulans	0	0	0	0	0	0	0	0
Gomphrena affinis subsp. *pilbarensis*	0	0	0	0	0	0	0	0
Gomphrena cunninghamii	0	0	0	0	0	0	0	0
Goodenia microptera	0	0	0	0	0.1	0	0.1	0.1
Goodenia muelleriana	0	0	0	0	0	0	0	0
Gossypium australe	0	0	0	0	0	0	0	0.1
Grevillea pyramidalis subsp. *leucadendron*	0	0	0	0	0	0	0	0
Grevillea wickhamii	0	0	0	0	0.1	0	0	0
Grona filiformis	0	0	0	0	0	0	0	0
Grona muelleri	0	0	0	0	0	0	0	0
Hakea lorea subsp. lorea	0	0	0	0	0	0	0	0
Hibiscus leptocladus	0	0	0	0	0	0	0	0
Hibiscus sturtii var. *campylochlamys*	0	0	0	0	0	0	0	0
Indigofera colutea	0	0	0	0	0.1	0	0	0
Indigofera linifolia	0	0	0	0	0	0	0	0.1
Indigofera trita subsp. *trita*	0	0	0.1	0	0	0.1	0	0
Ipomoea coptica	0.1	0.1	0.1	0	0	0.1	0.1	0
Iseilema dolichotrichum	0	0	0	0.1	0	0	0	0
Iseilema macratherum	0	0	0.1	0	0	0	0	0
Iseilema membranaceum	0	0	0	0	0	1	0	0
Isotropis atropurpurea	0	0	0	0	0.1	0	0	0.1
Ludwigia perennis	0	0.1	0	0	0	0.1	0	0
Marsilea hirsuta	0	0.1	0	0	0	0.1	0	0
Mimulus gracilis	0	0	0	0	0	0.1	0	0
Nellica maderaspatensis	0	0	0	0	0	0.1	0	0
Neptunia scutata	0	0.1	0.1	0.1	0.1	0.1	0.1	0
Neurachne muelleri	0	0	0	0	0	0	0	0
Notoleptopus decaisnei	0	0	0	0	0	0	0	0
Operculina aequisepala	0	0.1	0	0	0	0.1	0	0
Panicum australiense var. *australiense*	0	0	0	0.1	0.1	0	0.1	0.1
Panicum laevinode	0	0	4	0	0	0	0	0
Paranotis pterospora	0	0	0	0	0	0	0	0
Paspalidium clementii	0	0	0	0	0	0	0	0
Paspalidium rarum	0	0	0	0	0.1	0	0.1	0
Peplidium muelleri	0	0	0	0	0	0.1	0	0
Perotis rara	0	0	0	0	0	0	0	0
Pluchea rubelliflora	0.1	0	0.1	0	0	0	0	0
Pluchea tetranthera	0	0	0	0.1	0	0	0.1	0

Site	MGW01	MGW02	MGW03	MGW04	MGW05	MGW06	MGW07	MGW08
Polycarpaea corymbosa var. *corymbosa*	0	0	0	0	0.1	0	0	0
Polygala glaucifolia	0	0	0	0	0	0	0	0
Polygala isingii	0	0	0	0	0	0	0	0.1
Polymeria ambigua	0	0	0	0	0.1	0	0.1	0
Polymeria mollis	0	0	0	0	0	0	0	0
Portulaca filifolia	0	0	0	0	0	0	0	0
Portulaca oleracea	0	0.1	0.1	0	0.1	0.1	0.1	0
Ptilotus astrolasius	0	0	0	0	0	0	0	0
Ptilotus auriculifolius	0	0	0	0	0.1	0	0	0
Ptilotus axillaris	0	0	0	0	0.1	0	0	0.1
Ptilotus calostachyus	0	0	0	0	0	0	0	0
Ptilotus fusiformis	0	0	0	0	0.1	0	0.1	0.1
Ptilotus murrayi	1.5	0.1	0.5	0	0	0.1	0.1	0
Rhynchosia minima	0	0	0	0	0	0	0	0
Rostellularia adscendens var. *clementii*	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla* (thinly sericeous form MET 15,035)	0	0	0	1.5	0.1	0	0.1	0
Senna notabilis	0	0	0	0.1	0.1	0	0.1	0.1
Sesbania cannabina	0	0.1	0.1	0	0	0.1	0	0
Sida fibulifera	0	0	0	0	0	0.1	0.1	0
Sida rohlenae subsp. *rohlenae*	0	0	0	0	0	0	0	0
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0	0	0	0	0.1	0	0	0.1
Sida sp. Rabbit Flat (B.J. Carter 626)	0	0	0	0	0	0	0	0
Solanum diversiflorum	0	0	0	0	0	0	0	0.1
Sporobolus australasicus	0.1	0	0.1	0.1	0.1	0	0	0.1
Stemodia kingii	0	0	0.1	0	0	0.1	0	0
Streptoglossa decurrens	0	0	0	0	0	0	0.1	0
Streptoglossa tenuiflora	0	0	0	0	0	0.5	0	0
Tephrosia rosea var. *clementii*	0	0	0	0	0	0	0	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0	0	0	0	0.1	0	0	0.1
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0	0	0	0	0	0	0	0
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0	0	0	0	0	0	0	0
Trianthema pilosum	0	0	0	0	0.1	0	0	0.1
Trianthema triquetrum	0.1	0	0	0	0	0	0.1	0
Tribulopis angustifolia	0	0	0	0	0.1	0	0	0
Tribulus hirsutus	0	0	0	0	0.1	0	0	0.5
Tribulus macrocarpus	0	0	0	0	0	0	0	0
Trigastrotheca molluginea	0	0	0	0	0.1	0	0.1	0.1
Triodia epactia	18	0	1.5	27	9	0	28	0.5
Triodia schinzii	0	0	0	0	0	0	0	11
Triodia wiseana	0	0	0	0	0	0	0	0
Uvedalia clementii	0.1	0.1	0.1	0	0	0	0	0
Vigna lanceolata var. *lanceolata*	0	0.1	0.1	0	0	0	0	0
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0	0	0	0	0	0.1	0	0
Xerochloa laniflora	0.1	0	0.1	0	0	0	0	0

Site	MGW09	MGW10	MGW11	MGW12	MGW13	MGW14	MGW15
Floristic Group 32% similarity	f	e	e	f	f	a	f
Vegetation Association	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	ErxErbErgg DishErte	TeTsc AacAancAi ChCflCoz
Species							
Abutilon otocarpum	0	0	0	0.1	0.1	0	0
Acacia acradenia	0.5	1	0	0.1	6	0	0
Acacia adoxa var. *adoxa*	0	0	0.1	0	0	0	1
Acacia ancistrocarpa	0.5	2.5	0.1	0	0	0	0.1
Acacia colei var. indet	0	0	0.1	0	0	0	0
Acacia inaequilatera	0.1	0.1	0.1	0	0.1	0	0.5
Acacia sericophylla	0	0	0	0.5	0	0	0
Acacia stellaticeps	0	0	0	0.1	0	0	0
Acacia synchronicia	0	0	0	0	0	0	0
Afrohybanthus aurantiacus	0	0	0.1	0.5	0.1	0	0
Alternanthera nodiflora	0	0	0	0	0	0	0
Ammannia multiflora	0	0	0	0	0	0	0
Aristida holathera var. *holathera*	0.1	0.1	0.1	0.1	0.1	0	0
Aristida hygrometrica	0	0	0	0	0.1	0	0
Arivela uncifera	0	0.1	0	0	0	0	0
Arivela viscosa	0.1	0	0.1	0.1	0.1	0.1	0
Atalaya hemiglauca	0	0	0	0	0	0	0
Basilicum polystachyon	0	0	0	0	0	0	0
Bergia pedicellaris	0	0	0	0	0	0	0
Blumea tenella	0	0	0	0	0	0	0
Boerhavia burbidgeana	0	0	0	0	0	0	0
Boerhavia coccinea	0	0	0	0	0.1	0	0
Boerhavia gardneri	0	0	0	0	0	0	0
Bonamia erecta	0	0	0.1	4	0.1	0	0
Bonamia linearis	0	0	0	0.1	0	0	0
Bonamia media	0.1	0	0	0	0	0	0
Bonamia pannosa	0.1	0.1	0.1	0.5	0.1	0	0
Bonamia pilbarensis	0.1	0	0	0	0.1	0	0.1
Bulbostylis barbata	0.1	0.1	0	0.1	0.1	0	0.1
Bulbostylis turbinata	0	0	0	0	0	0.1	0
Carissa lanceolata	0	0	0	0	0.1	0	0.1
Centipeda minima subsp. *minima*	0	0	0	0	0	0	0
Chloris pectinata	0	0	0	0	0	0.1	0
Chrysopogon fallax	0	0	0	0.1	0	0	0
Commelina ensifolia	0	0	0	0	0	0	0
Corchorus elachocarpus	0	0	0	0	0	0	0
Corchorus parviflorus	0	0	0	0	0.1	0	0
Corchorus sidoides subsp. *vermicularis*	0	0.1	0.1	0.1	0.1	0	0
Corchorus tridens	0	0	0	0	0	0.1	0
Corymbia flavescens	0	0	0	0	0	0	0
Corymbia hamersleyana	0	0	0	1	3	0	0
Corymbia zygophylla	0	1.5	0	0	0	0	0
Crotalaria medicaginea var. *neglecta*	0	0	0	0.1	0.1	0	0.1
Crotalaria ramosissima	0	0	0.1	0.1	0	0	0
Cucumis variabilis	0	0	0	0.1	0	0	0
Cullen martinii	0	0	0	0	0	0	0
Cynodon convergens	0	0	0	0	0	12	0
Cyperus bulbosus	0	0	0	0	0	0.1	0
Cyperus iria	0	0	0	0	0	0	0
Cyperus squarrosus	0	0	0	0	0	0	0
Cyperus vaginatus	0	0	0	0	0	0	0
Dactyloctenium radulans	0	0	0	0	0	0.1	0
Dampiera candicans	0	0	0	0	0.1	0	0
Dichanthium sericeum subsp. *humilius*	0	0	0	0	0	9	0
Dodonaea coriacea	0	0	0.1	0	0.1	0	0
Dolichocarpa crouchiana	0	0	0	0	0	0	0.1
Eragrostis crateriformis	0	0	0	0	0	0	0

Site	MGW09	MGW10	MGW11	MGW12	MGW13	MGW14	MGW15
Eragrostis cumingii	0	0	0	0	0	0	0
Eragrostis eriopoda	0	0	0.1	18	0.1	0	0
Eragrostis exigua	0	0	0	0	0	0	0
Eragrostis tenellula	0	0	0	0	0	0.1	0
Eragrostis xerophila	0	0	0	0	0	20	0
Eriachne aristidea	0	0	0	0	0.1	0	0
Eriachne benthamii	0	0	0	0	0	1	0
Eriachne glauca var. *glauca*	0	0	0	0	0	8	0
Eriachne obtusa	0	0	0	18	2	0	0
Eriachne pulchella	0.1	0	0	0	0.1	0	0.1
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0	0.5	0	0	0
Eucalyptus odontocarpa	0	0	9	0	0	0	0
Eucalyptus victrix	0	0	0	0	0	0	0
Eulalia aurea	0	0	0	0	0	0	0
Euphorbia clementii	0	0.1	0.1	0	0	0	0.1
Euphorbia fitzroyensis	0	0	0	0	0	0.1	0
Euphorbia inappendiculata var. *inappendiculata*	0	0	0	0	0	0	0
Euphorbia trigonosperma	0	0	0	0.1	0.1	0	0
Euphorbia vaccaria var. *vaccaria*	0.1	0	0	0.1	0	0	0.1
Evolvulus alsinoides var. *villosicalyx*	0	0	0	0	0	0	0
Fimbristylis ammobia	0	0	0	0.1	0	0	0
Fimbristylis dichotoma	0	0	0	0	0	0	0
Fimbristylis simulans	0.1	0	0	0	0.1	0	0
Gomphrena affinis subsp. *pilbarensis*	0	0	0	0	0.1	0	0
Gomphrena cunninghamii	0	0	0	0	0.1	0	0
Goodenia microptera	0.1	0.1	0.1	0	0.1	0	0.1
Goodenia muelleriana	0	0	0	0	0	0	0.1
Gossypium australe	0.1	0	0	0.1	0	0	0
Grevillea pyramidalis subsp. *leucadendron*	0.5	0	0	0	0.1	0	0.1
Grevillea wickhamii	0	0	0.1	0	0.1	0	0
Grona filiformis	0	0.1	0	0.1	0.1	0	0
Grona muelleri	0	0	0	0	0	0	0
Hakea lorea subsp. lorea	0	0	0.1	0	0.1	0	0
Hibiscus leptocladus	0	0.1	0.1	0	0	0	0
Hibiscus sturtii var. *campylochlamys*	0	0	0	0.1	0.1	0	0
Indigofera colutea	0	0	0	0.1	0	0	0
Indigofera linifolia	0	0.1	0	0.1	0	0	0
Indigofera trita subsp. *trita*	0	0	0	0	0	0	0
Ipomoea coptica	0	0	0	0	0	0.1	0
Iseilema dolichotrichum	0	0	0	0	0	8	0
Iseilema macratherum	0	0	0	0	0	0	0
Iseilema membranaceum	0	0	0	0	0	8	0
Isotropis atropurpurea	0	0	0	0.5	0	0	0
Ludwigia perennis	0	0	0	0	0	0	0
Marsilea hirsuta	0	0	0	0	0	0	0
Mimulus gracilis	0	0	0	0	0	0	0
Nellica maderaspatensis	0	0	0	0	0	0.1	0
Neptunia scutata	0	0	0	0	0	0.1	0
Neurachne muelleri	0	0	0	0.1	0	0	0
Notoleptopus decaisnei	0.1	0	0	0	0.1	0	0
Operculina aequisepala	0	0	0	0	0	0	0
Panicum australiense var. *australiense*	0	0.1	0.1	0.1	0.1	0	0
Panicum laevinode	0	0	0	0	0	8	0
Paranotis pterospora	0	0.1	0.1	0	0	0	0
Paspalidium clementii	0	0	0	0	0.1	0	0
Paspalidium rarum	0	0	0	0	0	0	0
Peplidium muelleri	0	0	0	0	0	0	0
Perotis rara	0	0	0	0.1	0	0	0
Pluchea rubelliflora	0	0	0	0	0	0	0
Pluchea tetranthera	0	0	0	0	0	0	0

Site	MGW09	MGW10	MGW11	MGW12	MGW13	MGW14	MGW15
Polycarpaea corymbosa var. *corymbosa*	0.1	0	0	0	0	0	0
Polygala glaucifolia	0	0	0	0	0.1	0	0.1
Polygala isingii	0	0	0	0	0	0	0
Polymeria ambigua	0	0	0	0	0.1	0	0
Polymeria mollis	0	0	0	0	0	0	0
Portulaca filifolia	0	0	0	0	0	0.1	0
Portulaca oleracea	0.1	0	0	0.1	0.1	0.1	0.1
Ptilotus astrolasius	0	0	0.1	0	0	0	0
Ptilotus auriculifolius	0	0	0	0	0.1	0	0
Ptilotus axillaris	0.1	0	0	0	0.1	0	0
Ptilotus calostachyus	0	0	0	0	0.1	0	0.1
Ptilotus fusiformis	0	0.1	0	0	0.1	0	0
Ptilotus murrayi	0	0	0	0	0	1	0
Rhynchosia minima	0	0.1	0	0	0	0	0
Rostellularia adscendens var. *clementii*	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla* (thinly sericeous form MET 15,035)	0.1	0	0	0	0	0	0
Senna notabilis	0	0.1	0	0.1	0	0	0.1
Sesbania cannabina	0	0	0	0	0	0	0
Sida fibulifera	0	0	0	0	0	0.1	0
Sida rohlenae subsp. *rohlenae*	0	0	0	0	0.1	0	0
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	0	0	0.1	0.1	0	0.1
Sida sp. Rabbit Flat (B.J. Carter 626)	0	0	0	0.1	0	0	0
Solanum diversiflorum	0.1	0.1	0	0	0.1	0	0
Sporobolus australasicus	0.1	0	0	0	0.1	0.1	0
Stemodia kingii	0	0	0	0	0	0.1	0
Streptoglossa decurrens	0	0	0	0	0	0	0.1
Streptoglossa tenuiflora	0	0	0	0	0	0	0
Tephrosia rosea var. *clementii*	0	0	0	0.1	0.1	0	0
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	0	0	0	0	0	0
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0	0.1	0.1	0.1	0	0	0
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0	0	0	0	0.1	0	0.1
Trianthema pilosum	0	0.1	0.5	1	0.1	0	0
Trianthema triquetrum	0	0	0	0	0	0.1	0
Tribulopis angustifolia	0	0	0.1	0	0.1	0	0
Tribulus hirsutus	0.1	0	0	0.1	0.1	0	0
Tribulus macrocarpus	0	0.1	0.1	0	0	0	0.1
Trigastrotheca molluginea	0.1	0.1	0	0.1	3	0	0
Triodia epactia	9	0	0.1	15	13	0.1	8
Triodia schinzii	0	14	28	0	0	0	0
Triodia wiseana	0	0	0	0	0	0	0
Uvedalia clementii	0	0	0	0	0	0	0
Vigna lanceolata var. *lanceolata*	0	0	0	0	0	0	0
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0	0	0	0	0	0	0
Xerochloa laniflora	0	0	0	0	0	0	0

Site	MGW16	MGW17	MGW18	MGW19	MGW20	MGW21	MGW22	MGW23
Floristic Group 32% similarity	b	f	f	b	f	d	f	f
Vegetation Association	Ev AsyAcoAthe EuaErbChf Cyv	Te Ev ChfErbErx	TeTsc AacAancAi ChCflCoz	Ev AsyAcoAthe EuaErbChf Cyv	TeTsc AacAancAi ChCflCoz	Tw AacAi	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz
Species								
Abutilon otocarpum	0	0	0	0	0.1	0	0	0
Acacia acradenia	0	0	0	0	0.5	5.5	2	4
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0	0
Acacia ancistrocarpa	0	0	0	0	0	0.1	2	7
Acacia colei var. indet	1.5	0	0	0.1	0.1	0	0.1	4
Acacia inaequilatera	0	0	0	0	0	0	0	7
Acacia sericophylla	0	0	0	0	0	0	0	0
Acacia stellaticeps	0	0	9	0	0	0	0.5	0
Acacia synchronicia	0	0	0	15	0	0	0	0
Afrohybanthus aurantiacus	0	0	0.1	0	0.1	0	0.1	0
Alternanthera nodiflora	0.1	0	0	0.1	0	0	0	0
Ammannia multiflora	0	0	0	0.1	0	0	0	0
Aristida holathera var. *holathera*	0	0	0.1	0	0	0.1	0.1	0.1
Aristida hygrometrica	0	0	0.1	0	0.5	0	0	0
Arivela uncifera	0	0	0	0	0	0	0.1	0
Arivela viscosa	0	0	0.1	0	0.1	0	0.1	0.1
Atalaya hemiglauca	2	0	0	0	0	0	0	0
Basilicum polystachyon	0.1	0	0	0.1	0	0	0	0
Bergia pedicellaris	0	0	0	0.1	0	0	0	0
Blumea tenella	0.1	0	0	0.1	0	0	0	0
Boerhavia burbidgeana	0.1	0	0.5	0.1	0	0	0	0
Boerhavia coccinea	0	0	0	0	0	0	0.1	0.1
Boerhavia gardneri	0	0	0	0	1	0	0	0
Bonamia erecta	0	0	0	0	0.1	0.1	0.1	0
Bonamia linearis	0	0	0	0	0	0	0	0
Bonamia media	0	0	0	0	0	0	0	0.1
Bonamia pannosa	0	0	0.1	0	0.1	0.1	0.1	0.1
Bonamia pilbarensis	0	0	0	0	0	0	0	0
Bulbostylis barbata	0	0.1	0.1	0	0	0.1	0.1	0.1
Bulbostylis turbinata	0	0.1	0	0	0	0	0	0
Carissa lanceolata	0.1	0	0.1	0	0	0	0.1	1
Centipeda minima subsp. *minima*	0.1	0	0	0	0	0	0	0
Chloris pectinata	0	0	0	0	0	0	0	0
Chrysopogon fallax	20	0	0.1	10	0.1	0	0.1	0.1
Commelina ensifolia	0	0	0.1	0	0	0	0	0
Corchorus elachocarpus	0	0	0	0	0	0	0	0
Corchorus parviflorus	0	0	0	0	0	0	0	0
Corchorus sidoides subsp. *vermicularis*	0	0	0	0	0.1	0	0.1	0
Corchorus tridens	0	0	0	0.1	0.1	0	0	0
Corymbia flavescens	0	0	0	0	2	0	0	0
Corymbia hamersleyana	0	0	0.5	0	5	0	20	0
Corymbia zygophylla	0	0	0	0	0	0	0	0
Crotalaria medicaginea var. *neglecta*	0	0	0	0	0	0.1	0.1	0
Crotalaria ramosissima	0	0	0	0	0	0	0.1	0
Cucumis variabilis	0	0	0	0	0	0	0	0
Cullen martinii	0	0	0	0	0.1	0	0	0
Cynodon convergens	0	0	0	0.1	0	0	0	0
Cyperus bulbosus	0	0	0	0	0	0	0	0
Cyperus iria	0	0.1	0	0	0	0	0	0
Cyperus squarrosus	0	0.1	0	0.1	0	0	0	0
Cyperus vaginatus	0.1	0	0	1	0	0	0	0
Dactyloctenium radulans	0	0	0	0	0	0	0	0.1
Dampiera candicans	0	0	0	0	0.1	0	0.1	0
Dichanthium sericeum subsp. *humilius*	0.1	0.1	0	0.1	0	0	0	0
Dodonaea coriacea	0	0	0	0	0	0	0.1	0
Dolichocarpa crouchiana	0	0	0	0	0	0.1	0	0
Eragrostis crateriformis	0	0.1	0	0	0	0	0	0.1

Site	MGW16	MGW17	MGW18	MGW19	MGW20	MGW21	MGW22	MGW23
Eragrostis cumingii	0	0	0.1	0	0	0	0	0
Eragrostis eriopoda	0	0	0.1	0	0.5	0	0.1	0
Eragrostis exigua	0.1	0	0	0	0	0	0	0
Eragrostis tenellula	0	0.1	0	0	0	0	0	0
Eragrostis xerophila	0	2	0	0	0	0	0	0
Eriachne aristidea	0	0	0.1	0	0.1	0	0	0.1
Eriachne benthamii	20	0	0	5	0	0	0	0
Eriachne glauca var. *glauca*	0	0.1	0	0	0	0	0	0
Eriachne obtusa	0	0	0.1	0	0.1	0	0	0
Eriachne pulchella	0	0	0	0	0	0.1	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0	0	0	0	0	0
Eucalyptus odontocarpa	0	0	0	0	0	0	0	0
Eucalyptus victrix	6	0	0.5	12	0	0	0	0
Eulalia aurea	25	0	0	35	0	0	0	0
Euphorbia clementii	0	0	0	0	0	0.1	0	0
Euphorbia fitzroyensis	0.1	0	0	0.1	0	0	0	0
Euphorbia inappendiculata var. *inappendiculata*	0	0	0	0	0	0	0	0
Euphorbia trigonosperma	0	0	0	0	0.1	0	0.1	0
Euphorbia vaccaria var. *vaccaria*	0	0	0	0	0.1	0	0.1	0.1
Evolvulus alsinoides var. *villosicalyx*	0	0	0	0	0	0	0	0.1
Fimbristylis ammobia	0	0	0	0	0.1	0	0	0
Fimbristylis dichotoma	0	0	0	0	0	0	0	0
Fimbristylis simulans	0	0	0	0	0	0	0	0
Gomphrena affinis subsp. *pilbarensis*	0	0	0.1	0	0	0	0	0
Gomphrena cunninghamii	0	0	0	0	0	0	0	0
Goodenia microptera	0	0	0.1	0	0.1	0	0.1	0.1
Goodenia muelleriana	0	0	0	0	0	0	0	0
Gossypium australe	0	0	0	0	0	0	0	0.1
Grevillea pyramidalis subsp. *leucadendron*	0	0	0	0	0	0.1	0	0.1
Grevillea wickhamii	0	0	0	0	0.5	0.1	0.1	0
Grona filiformis	0	0	0	0.1	0.1	0	0.1	0
Grona muelleri	0	0	0.1	0	0	0	0	0
Hakea lorea subsp. lorea	0	0	0	0	0	0	0	0
Hibiscus leptocladus	0	0	0	0	0.1	0	0	0
Hibiscus sturtii var. *campylochlamys*	0	0	0	0	0.1	0	0.1	0
Indigofera colutea	0	0	0.1	0	0	0	0	0
Indigofera linifolia	0	0	0.1	0	0	0	0.1	0
Indigofera trita subsp. *trita*	0	0	0	0	0	0	0	0
Ipomoea coptica	0.1	0.1	0.1	0.1	0	0	0	0
Iseilema dolichotrichum	0	0	0	0	0	0	0	0
Iseilema macratherum	0	0	0	0.1	0	0	0	0
Iseilema membranaceum	0	0	0	0	0	0	0	0
Isotropis atropurpurea	0	0	0	0	0.1	0	0.1	0
Ludwigia perennis	0	0	0	0.1	0	0	0	0
Marsilea hirsuta	0.1	0	0	0.5	0	0	0	0
Mimulus gracilis	0	0	0	0.1	0	0	0	0
Nellica maderaspatensis	0.1	0	0	0.1	0	0	0	0
Neptunia scutata	0.1	0.1	0	0	0	0	0	0
Neurachne muelleri	0	0	0	0	0	0	0.1	0
Notoleptopus decaisnei	0	0	0	0	0.1	0	0.1	0
Operculina aequisepala	0	0	0	0.1	0	0	0	0
Panicum australiense var. *australiense*	0	0	0.1	0	0.1	0.1	0.1	0
Panicum laevinode	0	0.1	0.1	0	0	0	0	0
Paranotis pterospora	0	0	0	0	0	0	0	0
Paspalidium clementii	0	0	0	0	0	0	0	0.1
Paspalidium rarum	0	0.1	0.1	0	0	0	0	0
Peplidium muelleri	0	0	0	0.1	0	0	0	0
Perotis rara	0	0	0.1	0	0	0	0	0
Pluchea rubelliflora	0	0	0	0.1	0	0	0	0
Pluchea tetranthera	0	0	0.1	0	0	0	0	0

Site	MGW16	MGW17	MGW18	MGW19	MGW20	MGW21	MGW22	MGW23
Polycarpaea corymbosa var. *corymbosa*	0	0	0	0	0	0	0	0.1
Polygala glaucifolia	0	0	0	0	0	0.1	0	0
Polygala isingii	0	0	0	0	0	0	0	0
Polymeria ambigua	0	0	0	0	0	0	0.1	0
Polymeria mollis	0	0	0	0	0	0	0	0.1
Portulaca filifolia	0	0	0.1	0.1	0	0	0	0
Portulaca oleracea	0.1	0.1	0.1	0.1	0	0	0	0.1
Ptilotus astrolasius	0	0	0	0	0	0	0.1	0
Ptilotus auriculifolius	0	0	0	0	0	0	0	0
Ptilotus axillaris	0	0	0	0	0.1	0.1	0	0.1
Ptilotus calostachyus	0	0	0	0	0	0	0	0
Ptilotus fusiformis	0	0	0.1	0	0.1	0	0.1	0
Ptilotus murrayi	0.1	0.1	0.1	0.1	0	0	0	0
Rhynchosia minima	0	0.1	0.1	0	0.1	0	0	0
Rostellularia adscendens var. *clementii*	0.1	0	0	0.1	0	0	0	0
Senna artemisioides subsp. *oligophylla* (thinly sericeous form MET 15,035)	0	0.1	0	0	0	0	0	0.1
Senna notabilis	0	0	0.1	0	0.1	0	0.1	0.1
Sesbania cannabina	0.1	0	0	0.1	0	0	0	0
Sida fibulifera	0	0	0	0	0	0	0	0
Sida rohlenae subsp. *rohlenae*	0	0	0	0	0.1	0	0.1	0
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0	0	0	0	0.1	0	0.1	0.1
Sida sp. Rabbit Flat (B.J. Carter 626)	0	0	0	0	0.1	0	0	0
Solanum diversiflorum	0	0	0	0	0.1	0	0.1	0
Sporobolus australasicus	0	0.1	0	0.1	0.1	0	0	0.1
Stemodia kingii	0.1	0	0	0	0	0	0	0
Streptoglossa decurrens	0	0.1	0	0	0	0	0	0
Streptoglossa tenuiflora	0	0	0	0	0	0	0	0
Tephrosia rosea var. *clementii*	0	0	0	0	0.1	0	0	0
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0	0	0	0	0	0	0.1	0
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0	0	0	0	0	0	0.1	0
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0	0	0	0	0	0	0	0
Trianthema pilosum	0	0	0.1	0	0.5	0	0.1	0
Trianthema triquetrum	0	0	0	0.1	0	0	0	0
Tribulopis angustifolia	0	0	0.1	0	0.1	0	0	0
Tribulus hirsutus	0	0	0	0	0	0	0	0.1
Tribulus macrocarpus	0	0	0	0	0	0.1	0.1	0
Trigastrotheca molluginea	0	0	0.1	0	0.1	0.1	0.1	0.1
Triodia epactia	0	25	11	0	4	0.5	9	28
Triodia schinzii	0	0	0.1	0	0	0	2	0
Triodia wiseana	0	0	0	0	0	35	0	0
Uvedalia clementii	0.1	0	0	0	0	0	0	0
Vigna lanceolata var. *lanceolata*	0	0	0	0	0	0	0	0
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0	0	0	0.1	0	0	0	0
Xerochloa laniflora	0	0	0	0	0	0	0	0

Site	MGW24	MGW25	MGW26	MGW27	MGW45	MGW-R01	MGW-R02
Floristic Group 32% similarity	a	f	f	d	a	f	f
Vegetation Association	ErxErbErgg DishErte	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz	Tw AacAi	ErxErbErgg DishErte	TeTsc AacAancAi ChCflCoz	TeTsc AacAancAi ChCflCoz
Species							
Abutilon otocarpum	0	0	0	0	0	0	0
Acacia acradenia	0	0.1	1.5	0	0	0	0
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0
Acacia ancistrocarpa	0	0	0	0	0	0	0.1
Acacia colei var. indet	0	0	0	0	0	0	0
Acacia inaequilatera	0	1	0	0.1	0	0.1	0
Acacia sericophylla	0	0	0	0	0	0	0
Acacia stellaticeps	0	9	0	0	0	0	0
Acacia synchronicia	0	0	0	0	0	0	0
Afrohybanthus aurantiacus	0	0.1	0.1	0	0	0	0.1
Alternanthera nodiflora	0	0	0	0	0	0	0
Ammannia multiflora	0	0	0	0	0	0	0
Aristida holathera var. *holathera*	0	0.1	0.1	0	0	0	0.1
Aristida hygrometrica	0	0	0	0	0	0	0
Arivela uncifera	0	0.1	0	0	0	0	0.1
Arivela viscosa	0	0.1	0	0.1	0.1	0.1	0.1
Atalaya hemiglauca	0	0	0	0	0	0	0
Basilicum polystachyon	0	0	0	0	0	0	0
Bergia pedicellaris	0	0	0	0	0	0	0
Blumea tenella	0	0	0	0	0	0	0
Boerhavia burbidgeana	0	0.5	0	0	0	0	0
Boerhavia coccinea	0	0	0	0	0	0	0
Boerhavia gardneri	0	0	0	0	0	0	0
Bonamia erecta	0	0.5	0.1	0	0	0	0.5
Bonamia linearis	0	0	0	0	0	0	0
Bonamia media	0	0	0.1	0	0	0	0
Bonamia pannosa	0	0.1	0.1	0	0	0	0.1
Bonamia pilbarensis	0	0	0	0.1	0	0.1	0
Bulbostylis barbata	0	0.1	0.1	0	0	0.1	0.1
Bulbostylis turbinata	0.1	0	0	0	0.1	0	0
Carissa lanceolata	0	0.1	0	0	0	0	0.1
Centipeda minima subsp. *minima*	0	0	0	0	0	0	0
Chloris pectinata	0	0	0	0	0	0	0
Chrysopogon fallax	0	0.1	0	0	0	0	0.1
Commelina ensifolia	0	0	0	0	0	0	0
Corchorus elachocarpus	0	0	0	0	0	0.1	0
Corchorus parviflorus	0	0	0	0.1	0	0	0
Corchorus sidoides subsp. *vermicularis*	0	0	0	0	0	0	0
Corchorus tridens	0	0	0	0	0.1	0	0
Corymbia flavescens	0	0	0	0	0	0	22
Corymbia hamersleyana	0	1	0.5	0	0	0.5	0.1
Corymbia zygophylla	0	0	0	0	0	0	0
Crotalaria medicaginea var. *neglecta*	0	0	0.1	0.1	0	0	0
Crotalaria ramosissima	0	0	0	0	0	0	0.1
Cucumis variabilis	0	0	0.1	0	0	0	0
Cullen martinii	0	0	0	0	0	0	0
Cynodon convergens	0	0	0	0	0.1	0	0
Cyperus bulbosus	0	0	0	0	0	0	0
Cyperus iria	0	0	0	0	0.1	0	0
Cyperus squarrosus	0	0	0	0	0	0	0
Cyperus vaginatus	0	0	0	0	0	0	0
Dactyloctenium radulans	0	0	0	0	0.1	0	0
Dampiera candicans	0	0	0.1	0	0	0	0
Dichanthium sericeum subsp. *humilius*	22	0	0	0	31	0	0
Dodonaea coriacea	0	0	0	0	0	0	0
Dolichocarpa crouchiana	0	0	0	0.1	0	0.1	0
Eragrostis crateriformis	0	0	0	0	0	0	0

Site	MGW24	MGW25	MGW26	MGW27	MGW45	MGW-R01	MGW-R02
Eragrostis cumingii	0	0	0	0	0	0	0
Eragrostis eriopoda	0	5	0	0	0	0	10
Eragrostis exigua	0	0	0	0	0	0	0
Eragrostis tenellula	0.1	0	0	0	0	0	0
Eragrostis xerophila	23	0	0	0	31	0	0
Eriachne aristidea	0	0	0	0	0	0	0
Eriachne benthamii	23	0	0	0	0	0	0
Eriachne glauca var. *glauca*	0.1	0	0	0	0.1	0	0
Eriachne obtusa	0	0.1	0.1	0	0	0	10
Eriachne pulchella	0	0	0.1	0.1	0	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0	0	0	0	0
Eucalyptus odontocarpa	0	0	0	0	0	0	0
Eucalyptus victrix	0	0	0	0	0	0	0
Eulalia aurea	0	0	0	0	0	0	0
Euphorbia clementii	0	0	0.1	0.1	0	0.1	0
Euphorbia fitzroyensis	0	0	0	0	0	0	0
Euphorbia inappendiculata var. *inappendiculata*	0	0	0	0	0	0	0
Euphorbia trigonosperma	0	0.1	0	0	0.1	0	0
Euphorbia vaccaria var. *vaccaria*	0	0	0	0	0	0.1	0
Evolvulus alsinoides var. *villosicalyx*	0	0.1	0	0	0	0	0
Fimbristylis ammobia	0	0	0	0	0	0	0
Fimbristylis dichotoma	0	0	0	0	0	0	0
Fimbristylis simulans	0	0	0	0	0	0	0
Gomphrena affinis subsp. *pilbarensis*	0	0	0	0	0	0	0
Gomphrena cunninghamii	0	0	0	0.1	0	0	0
Goodenia microptera	0	0.1	0.1	0.1	0	0	0
Goodenia muelleriana	0	0	0	0	0	0.1	0
Gossypium australe	0	0	0	0	0	0	0
Grevillea pyramidalis subsp. *leucadendron*	0	0	0.1	0	0	0.1	0
Grevillea wickhamii	0	0	0.1	0	0	0.1	0.1
Grona filiformis	0	0	0	0	0	0	0.1
Grona muelleri	0	0.1	0	0	0.1	0	0
Hakea lorea subsp. lorea	0	0.1	0	0	0	0	0.1
Hibiscus leptocladus	0	0	0	0	0	0	0
Hibiscus sturtii var. *campylochlamys*	0	0	0	0	0	0	0.1
Indigofera colutea	0	0	0	0	0	0	0
Indigofera linifolia	0	0.1	0	0	0.1	0	0
Indigofera trita subsp. *trita*	0	0	0	0	0.1	0	0
Ipomoea coptica	0.1	0	0	0	1	0	0
Iseilema dolichotrichum	0	0	0	0	1	0	0
Iseilema macratherum	1	0	0	0	0	0	0
Iseilema membranaceum	0	0	0	0	0	0	0
Isotropis atropurpurea	0	0.1	0.1	0	0	0	0
Ludwigia perennis	0	0	0	0	0	0	0
Marsilea hirsuta	0.1	0	0	0	0	0	0
Mimulus gracilis	0.1	0	0	0	0	0	0
Nellica maderaspatensis	0.1	0	0	0	0	0	0
Neptunia scutata	0.1	0	0	0	0.1	0	0
Neurachne muelleri	0	0	0.1	0	0	0	0
Notoleptopus decaisnei	0	0.1	0.1	0	0	0.1	0
Operculina aequisepala	0	0	0	0	0	0	0
Panicum australiense var. *australiense*	0	0.1	0.1	0.1	0	0.1	0
Panicum laevinode	0.1	0	0	0	0	0	0
Paranotis pterospora	0	0	0	0	0	0	0
Paspalidium clementii	0	0	0	0	0	0	0
Paspalidium rarum	0	0	0	0	0	0	0.1
Peplidium muelleri	0	0	0	0	0	0	0
Perotis rara	0	0	0	0	0	0	0
Pluchea rubelliflora	0	0	0	0	0	0	0
Pluchea tetranthera	0	0	0	0	0	0	0

Site	MGW24	MGW25	MGW26	MGW27	MGW45	MGW-R01	MGW-R02
Polycarpaea corymbosa var. *corymbosa*	0	0	0	0	0	0	0
Polygala glaucifolia	0	0	0.1	0.1	0	0	0
Polygala isingii	0	0	0	0	0.1	0	0
Polymeria ambigua	0	0	0	0	0	0	0.1
Polymeria mollis	0	0.1	0	0	0	0	0
Portulaca filifolia	0	0	0	0	0	0	0
Portulaca oleracea	0	0	0	0	0	0	0
Ptilotus astrolasius	0	0	0	0	0	0	0
Ptilotus auriculifolius	0	0	0	0	0	0.1	0
Ptilotus axillaris	0	0	0.1	0	0	0	0
Ptilotus calostachyus	0	0	0	0	0	0	0
Ptilotus fusiformis	0	0	0	0	0	0	0.1
Ptilotus murrayi	0.1	0	0	0	0.1	0	0
Rhynchosia minima	0	0	0	0	0.1	0	0
Rostellularia adscendens var. *clementii*	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla* (thinly sericeous form MET 15,035)	0	0	0	0	0	0	0
Senna notabilis	0	0.1	0.1	0.1	0	0	0.1
Sesbania cannabina	0.1	0	0	0	0	0	0
Sida fibulifera	0	0	0	0	0.1	0	0
Sida rohlenae subsp. *rohlenae*	0	0	0	0	0	0	0
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0	0.1	0.1	0.1	0	0	0.1
Sida sp. Rabbit Flat (B.J. Carter 626)	0	0	0	0	0	0	0
Solanum diversiflorum	0	0	0	0	0	0	0
Sporobolus australasicus	0	0	0	0	10	0	0.1
Stemodia kingii	0.1	0	0	0	0	0	0
Streptoglossa decurrens	0	0	0	0	0	0	0
Streptoglossa tenuiflora	0	0	0	0	0	0	0
Tephrosia rosea var. *clementii*	0	0	0	0	0	0	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0	0	0	0	0	0	0
Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	0	0.1	0	0	0	0	0
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0	0	0	0	0	0	0
Trianthema pilosum	0	0.1	0.1	0	0	0	0.1
Trianthema triquetrum	0	0	0	0	0	0	0
Tribulopis angustifolia	0	0.1	0	0	0	0	0.1
Tribulus hirsutus	0	0.1	0.1	0	0	0.1	0
Tribulus macrocarpus	0	0	0	0	0	0	0
Trigastrotheca molluginea	0	0.1	0.1	0	0	0.1	0.1
Triodia epactia	0	27	12	0	0	9	2.5
Triodia schinzii	0	0.1	0	0	0	0	0
Triodia wiseana	0	0	0	35	0	0	0
Uvedalia clementii	0	0	0	0	0	0	0
Vigna lanceolata var. *lanceolata*	0	0	0	0	0	0	0
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0	0	0	0	0	0	0
Xerochloa laniflora	0	0	0	0	0	0	0

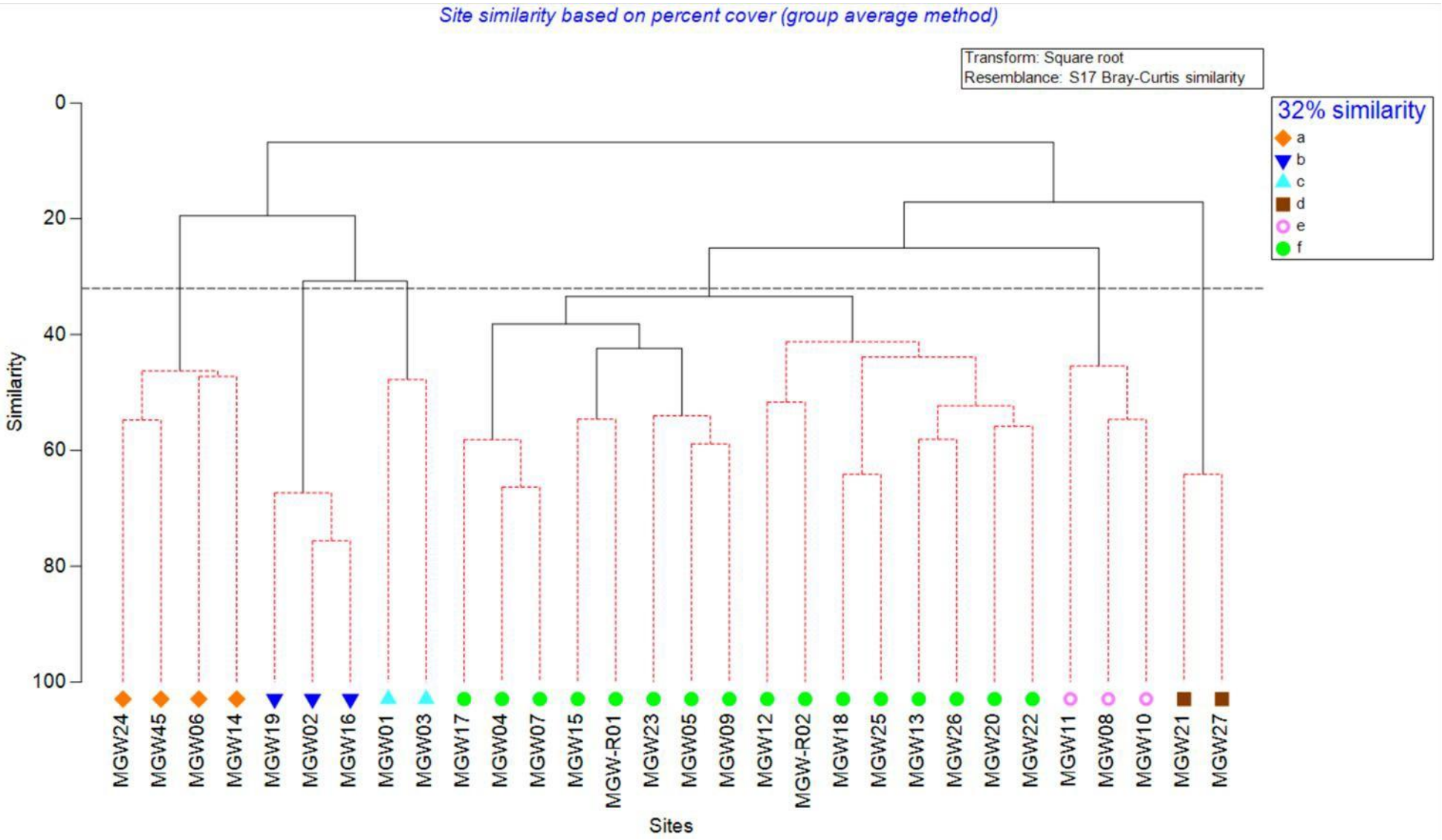

Figure 1: Dendrogram showing floristic similarity of sampling sites in the Survey Area, coded by floristic groups at the 32% similarity level (FG_a to FG_f).

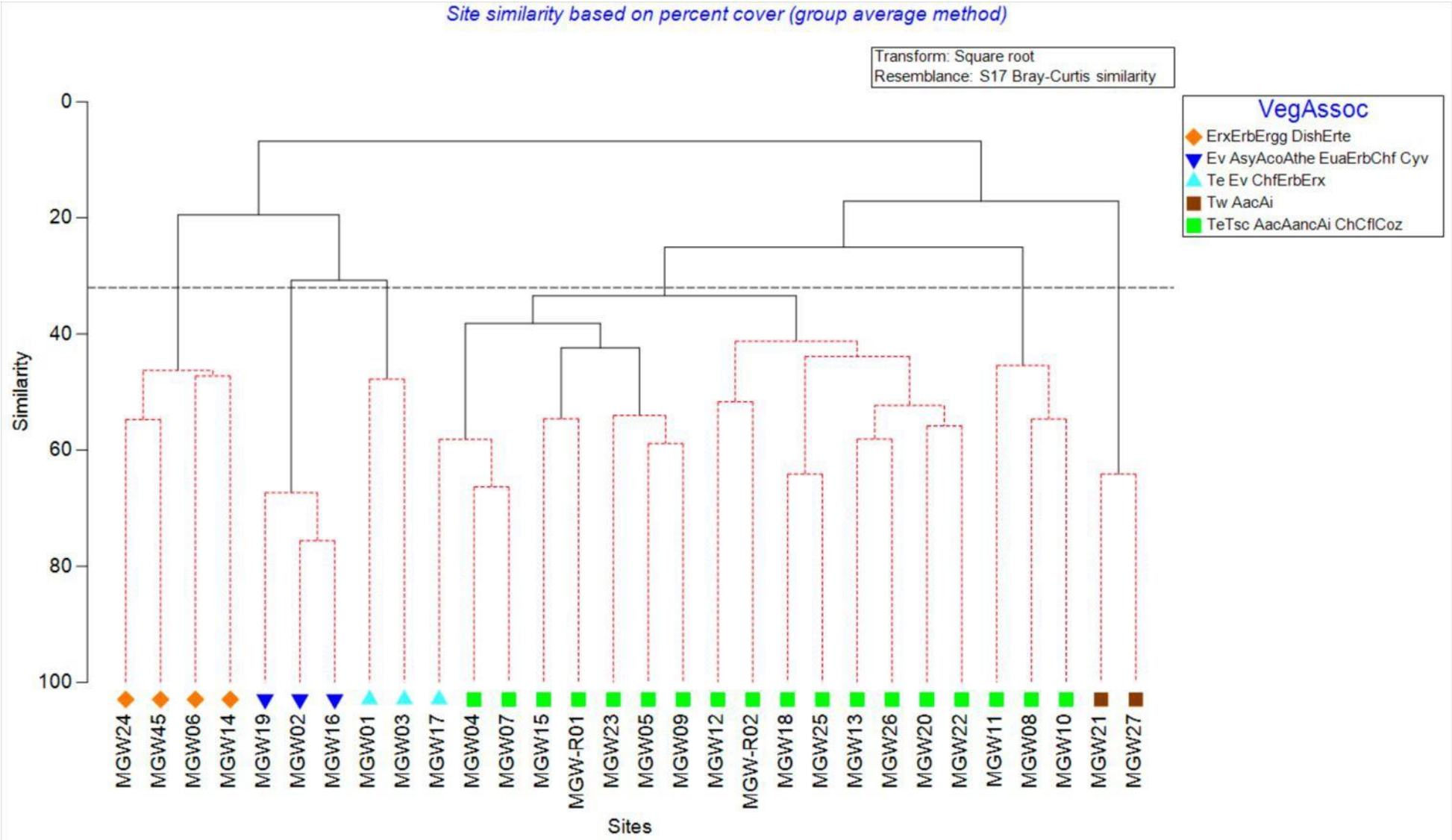

Figure 2: Dendrogram showing floristic similarity of sampling sites in the Survey Area, coded by vegetation association.

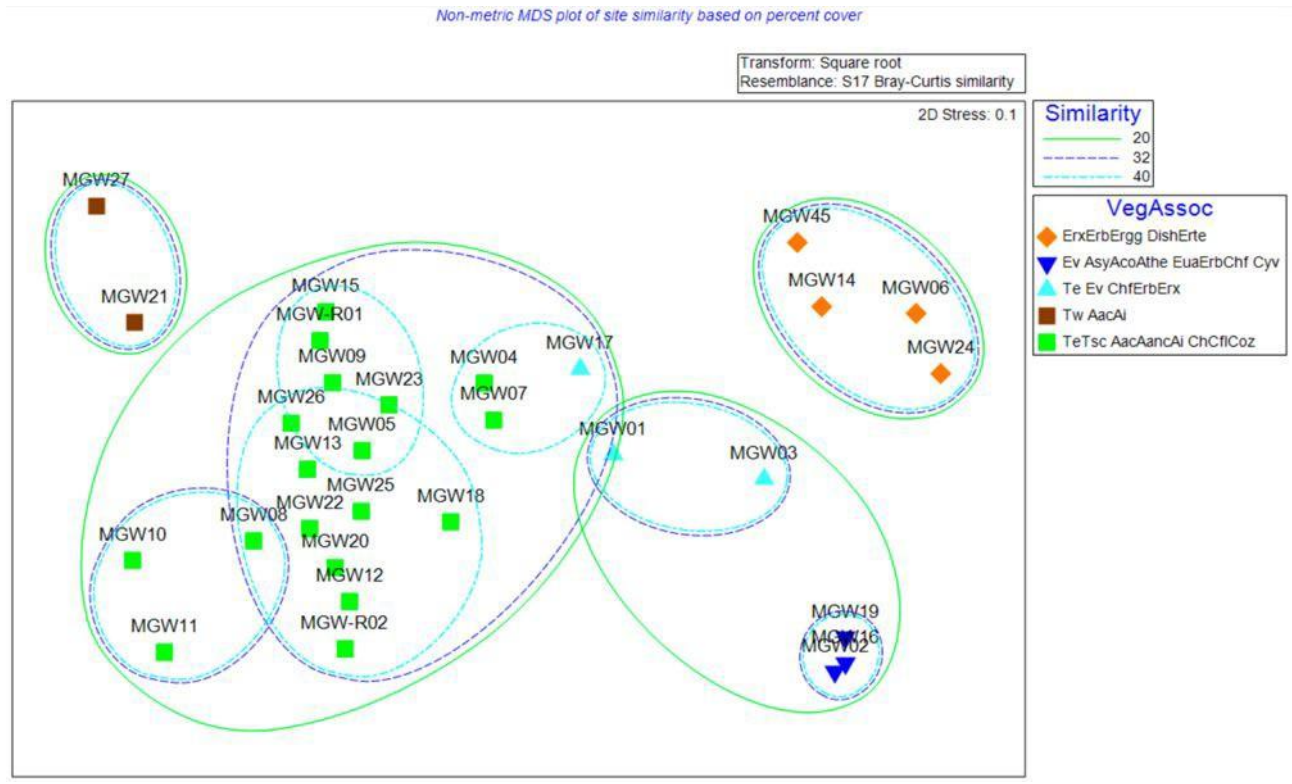

Figure 3: NMDS plot showing floristic similarity of sampling sites in the Survey Area, coded by vegetation association.

Appendix 8

List of Vascular Flora Recorded from the Survey Area

Family	Species	Status/Notes
Acanthaceae	*Rostellularia adscendens* var. *clementii*	
Aizoaceae	*Trianthema pilosum*	
	Trianthema triquetrum	
Amaranthaceae	*Alternanthera nodiflora*	
	Gomphrena a[inis subsp. *pilbarensis*	
	Gomphrena cunninghamii	
	Ptilotus astrolasius	
	Ptilotus auriculifolius	
	Ptilotus axillaris	
	Ptilotus calostachyus	
	Ptilotus clementii	
	Ptilotus exaltatus	
	Ptilotus fusiformis	
	Ptilotus murrayi	
Apocynaceae	**Calotropis procera*	Weed (Declared Pest)
	Carissa lanceolata	
Araliaceae	*Trachymene oleracea* subsp. *oleracea*	
Asteraceae	*Blumea tenella*	
	Centipeda minima subsp. *minima*	
	**Flaveria trinervia*	Weed
	Pluchea rubelliflora	
	Pluchea tetranthera	
	Pterocaulon sphacelatum	
	Streptoglossa bubakii	
	Streptoglossa decurrens	
	Streptoglossa odora	Q12 of Pilbara Flora (2009)
	Streptoglossa tenuiflora	
	Streptoglossa ? *tenuiflora*	InsuUicient material; sterile
	Streptoglossa sp. indet.	InsuUicient material; sterile
Boraginaceae	*Ehretia saligna* var. *saligna*	
	Euploca cunninghamii	
	Euploca diversifolia	
	Euploca ? *pachyphylla*	InsuUicient material; sterile
	Trichodesma zeylanicum var. *zeylanicum*	
Capparaceae	*Capparis lasiantha*	
Caryophyllaceae	*Polycarpaea corymbosa* var. *corymbosa*	
	Polycarpaea holtzei	
	Polycarpaea longiflora	
Chenopodiaceae	*Dysphania* sp. indet.	InsuUicient material; sterile
Cleomaceae	*Arivela uncifera*	
	Arivela viscosa	
Commelinaceae	*Commelina ensifolia*	
Convolvulaceae	*Bonamia alatisemina*	
	Bonamia erecta	

Family	Species	Status/Notes
Convolvulaceae (cont.)	*Bonamia linearis*	
	Bonamia ? *linearis*	InsuUicient material
	Bonamia media	
	Bonamia oblongifolia	Priority 3
	Bonamia pannosa	
	Bonamia pilbarensis	
	Evolvulus alsinoides var. *decumbens*	
	Evolvulus alsinoides var. *villosicalyx*	
	Ipomoea coptica	
	Operculina aequisepala	
	Polymeria ambigua	
	Polymeria mollis	
	Polymeria ? *mollis*	InsuUicient material; sterile
Cucurbitaceae	*Cucumis variabilis*	
	Cucumis sp.	InsuUicient material
Cyperaceae	*Bulbostylis barbata*	
	Bulbostylis turbinata	
	Cyperus bulbosus	
	Cyperus ? *dactylotes*	InsuUicient material; sterile
	Cyperus iria	
	Cyperus squarrosus	
	Cyperus vaginatus	
	Fimbristylis ammobia	
	Fimbristylis dichotoma	
	Fimbristylis littoralis	
	Fimbristylis microcarya	
	Fimbristylis simulans	
	Schoenoplectiella laevis	
Elatinaceae	*Bergia pedicellaris*	
Euphorbiaceae	*Euphorbia clementii*	Priority 3
	Euphorbia fitzroyensis	
	Euphorbia inappendiculata var. *inappendiculata*	Priority 3
	Euphorbia inappendiculata var. *queenslandica*	Priority 3 (range extension)
	Euphorbia trigonosperma	
	Euphorbia vaccaria var. *vaccaria*	
Fabaceae	*Acacia acradenia*	
	Acacia adoxa var. *adoxa*	
	Acacia ancistrocarpa	
	Acacia colei var. indet.	Sterile
	Acacia coriacea subsp. *coriacea*	
	Acacia inaequilatera	
	Acacia monticola	Q10 of Pilbara Flora (2009)
	Acacia sericophylla	
	Acacia sphaerostachya	

Family	Species	Status/Notes
Fabaceae (cont.)	*Acacia stellaticeps*	
	Acacia synchronicia	
	Acacia ? *trachycarpa* x *tumida* var. *pilbarensis*	Hybrid; sterile
	Acacia tumida var. *pilbarensis*	
	Aeschynomene indica	
	Alysicarpus muelleri	
	Cajanus marmoratus	
	Crotalaria medicaginea var. *neglecta*	
	Crotalaria ramosissima	
	Cullen martinii	
	Cullen ? *pogonocarpum*	InsuUicient material; sterile
	Cullen ? *stipulaceum*	InsuUicient material; sterile
	Grona filiformis	
	Grona muelleri	
	Grona ? *muelleri*	InsuUicient material; sterile
	Indigofera colutea	
	Indigofera linifolia	
	Indigofera linnaei	
	Indigofera monophylla	
	**Indigofera oblongifolia*	Weed
	Indigofera trita subsp. *trita*	
	Isotropis atropurpurea	
	Lysiphyllum cunninghamii	
	Neptunia scutata	
	Neptunia ? *scutata*	InsuUicient material; sterile
	Neptunia xanthonema	
	Petalostylis labicheoides	
	Rhynchosia minima	
	Senna artemisioides subsp. *oligophylla*	Thinly sericeous form.
	Senna notabilis	
	Sesbania cannabina	
	Swainsona ? *maccullochiana*	InsuUicient material; sterile
	Tephrosia rosea var. *clementii*	
	Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	
	Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)	
	Tephrosia ? sp. Northern (K.F. Kenneally 11950)	InsuUicient material; sterile
	Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	
	**Vachellia farnesiana*	Weed
	Vigna lanceolata var. *lanceolata*	
	Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	
Goodeniaceae	*Dampiera candicans*	
	Goodenia forrestii	
	Goodenia lamprosperma	

Family	Species	Status/Notes
Goodeniaceae (cont.)	*Goodenia microptera*	
	Goodenia muelleriana	
Gyrostemonaceae	*Codonocarpus cotinifolius*	
Lamiaceae	*Basilicum polystachyon*	
Lythraceae	*Ammannia multiflora*	
Malvaceae	*Abutilon lepidum*	
	Abutilon otocarpum	
	Abutilon sp. Pilbara (W.R. Barker 2025)	
	Corchorus elachocarpus	
	Corchorus parviflorus	
	Corchorus sidoides subsp. *vermicularis*	
	Corchorus ? *sidoides* subsp. *vermicularis*	InsuUicient material; sterile
	Corchorus tridens	
	Corchorus sp. indet.	InsuUicient material
	Gossypium australe	
	Hibiscus leptocladus	
	Hibiscus sturtii var. *campylochlamys*	
	Hibiscus sturtii var. *grandiflorus*	
	Sida echinocarpa	
	Sida fibulifera	
	Sida rohlenae subsp. *rohlenae*	
	Sida sp. Pilbara (A.A. Mitchell PRP 1543)	
	Sida sp. Pindan (B.G. Thomson 3398)	
	Sida sp. Rabbit Flat (B.J. Carter 626)	
Marsileaceae	*Marsilea hirsuta*	
	Marsilea sp. indet.	InsuUicient material; sterile
Molluginaceae	*Trigastrotheca molluginea*	
Montiaceae	*Calandrinia ptychosperma*	
	Calandrinia pumila	
Myrtaceae	*Corymbia flavescens*	
	Corymbia hamersleyana	
	Corymbia zygophylla	
	Eucalyptus leucophloia subsp. *leucophloia*	
	Eucalyptus odontocarpa	
	Eucalyptus victrix	
Nyctaginaceae	*Boerhavia burbidgeana*	
	Boerhavia coccinea	
	Boerhavia gardneri	
	Boerhavia ? *gardneri*	InsuUicient material; sterile
Onagraceae	*Ludwigia perennis*	
Pedaliaceae	*Josephinia* sp. indet.	InsuUicient material; potential Priority 1

Family	Species	Status/Notes
Phrymaceae	*Mimulus gracilis*	
	Peplidium muelleri	
	Uvedalia clementii	Priority 1
Phyllanthaceae	*Nellica maderaspatensis*	
	Notoleptopus decaisnei	
Plantaginaceae	*Stemodia kingii*	
Poaceae	*Aristida contorta*	
	Aristida holathera var. *holathera*	
	Aristida hygrometrica	
	**Cenchrus ciliaris*	Weed
	**Cenchrus setiger*	Weed
	Chloris pectinata	
	Chrysopogon fallax	
	Cynodon convergens	
	Dactyloctenium radulans	
	Dichanthium fecundum	
	Dichanthium sericeum subsp. *humilius*	
	**Echinochloa colona*	Weed
	Elytrophorus spicatus	
	Eragrostis crateriformis	
	Eragrostis cumingii	
	Eragrostis dielsii	
	Eragrostis eriopoda	
	Eragrostis exigua	
	Eragrostis tenellula	
	Eragrostis xerophila	
	Eriachne aristidea	
	Eriachne benthamii	
	Eriachne glauca var. *glauca*	
	Eriachne helmsii	
	Eriachne obtusa	
	Eriachne pulchella	Subspecies delineation unclear.
	Eulalia aurea	
	Iseilema dolichotrichum	
	Iseilema macratherum	
	Iseilema membranaceum	
	Iseilema vaginiflorum	
	Iseilema sp.	InsuUicient material; sterile
	Neurachne muelleri	
	Panicum australiense var. *australiense*	
	Panicum laevinode	
	Paspalidium clementii	
	Paspalidium rarum	

Family	Species	Status/Notes
Poaceae (cont.)	*Perotis rara*	
	Sporobolus australasicus	
	Sporobolus mitchellii	
	Triodia epactia	
	Triodia schinzii	
	Triodia wiseana	
	Urochloa distachyos	
	Xerochloa laniflora	
Polygalaceae	*Polygala glaucifolia*	
	Polygala isingii	
Portulacaceae	*Portulaca filifolia*	
	Portulaca oleracea	
	Portulaca sp. (*oleracea/intraterranea*)	InsuUicient material
	Portulaca pilosa/decipiens	
	Portulaca sp.	InsuUicient material; sterile
Proteaceae	*Grevillea pyramidalis* subsp. *leucadendron*	
	Grevillea wickhamii subsp. indet.	Sterile
	Grevillea wickhamii subsp. *macrodonta*	Q10 of Pilbara Flora (2009)
	Hakea lorea subsp. *lorea*	
Rubiaceae	*Dolichocarpa crouchiana*	
	Paranotis pterospora	
Sapindaceae	*Atalaya hemiglauca*	
	Dodonaea coriacea	
Solanaceae	*Solanum diversiflorum*	
	Solanum lasiophyllum	
	Solanum sp. (*perarmatum/cleistogamum*; indet.)	InsuUicient material
Violaceae	*Afrohybanthus aurantiacus*	
Zygophyllaceae	*Tribulopis angustifolia*	
	Tribulopis sp. (*marliesiae/angustifolia*)	InsuUicient material; potential Priority 3
	Tribulus hirsutus	
	Tribulus ? *hirsutus*	InsuUicient material
	Tribulus macrocarpus	
	Tribulus platypterus	

Appendix 9

Locations of Weeds in the Survey Area

Species	Site	Easting	Northing	Date	Specimen	Cover (%)	Height (cm)	No. of Individuals
Declared Pests								
**Calotropis procera*	Opportunistic	765260	7745505	26/3/2025	-	0.1	140	1
Other Weeds								
**Cenchrus ciliaris*	MGW-01	760453	7744679	25/3/2025	-	0.1	20	1
**Cenchrus ciliaris*	MGW-05	765200	7745196	26/3/2025	-	0.1	65	1
**Cenchrus ciliaris*	MGW-08	765448	7745867	27/3/2025	-	0.25	45	2
**Cenchrus ciliaris*	MGW-12	763398	7745723	25/3/2025	-	3	25	2
**Cenchrus ciliaris*	MGW-13	763410	7745895	25/3/2025	-	0.1	50	1
**Cenchrus ciliaris*	MGW-20	762880	7745766	28/3/2025	-	0.5	40	1
**Cenchrus ciliaris*	MGW-22	764702	7745714	29/3/2025	-	1.5	60	1
**Cenchrus ciliaris*	MGW-R02	764013	7745636	29/3/2025	-	0.1	50	1
**Cenchrus setiger*	MGW-01	760453	7744679	25/3/2025	MGW-01-16	0.1	40	1
**Cenchrus setiger*	MGW-03	761119	7744871	25/3/2025	-	0.1	10	1
**Echinochloa colona*	Opportunistic	763039	7744132	28/3/2025	-	0.1	30	5
**Echinochloa colona*	MGW-01	760453	7744679	25/3/2025	-	0.1	15	1
**Echinochloa colona*	MGW-02	760810	7744952	25/3/2025	-	0.1	50	1
**Echinochloa colona*	MGW-06	764920	7744611	26/3/2025	-	0.1	25	1
**Flaveria trinervia*	MGW-03	761119	7744871	25/3/2025	MGW-03-02	0.1	10	1
**Indigofera oblongifolia*	MGW-02	760810	7744952	25/3/2025	MGW-02-11	0.1	50	1
**Vachellia farnesiana*	MGW-01	760453	7744679	25/3/2025	-	0.1	120	2
**Vachellia farnesiana*	MGW-02	760810	7744952	25/3/2025	-	0.5	200	8
**Vachellia farnesiana*	MGW-06	764920	7744611	26/3/2025	-	0.1	40	1
**Vachellia farnesiana*	MGW-16	761765	7744919	28/3/2025	-	0.1	220	11
**Vachellia farnesiana*	MGW-17	761298	7745268	28/3/2025	-	0.1	200	1
**Vachellia farnesiana*	MGW-19	762957	7744133	28/3/2025	-	0.5	180	20
**Vachellia farnesiana*	MGW-22	764702	7745714	29/3/2025	-	0.1	60	1