Flora and Vegetation Survey Gap Analysis

Woodie Woodie Mine

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

MBS Environmental and
Consolidated Minerals

Date

January 2020

DOCUMENT STATUS				
VERSION	**TYPE**	**AUTHOR/S**	**REVIEWER/S**	**DATE DISTRIBUTED**
V1	Internal review	E.M. Mattiske	-	-
V2	Draft for client	E.M. Mattiske	E. Mattiske	17/12/2019
FINAL	Final report	L. Rowles/E. Mattiske	E. Mattiske	15/01/2020

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437
Kalamunda WA 6926
Phone: +61 8 9257 1625
Email: admin@mattiske.com.au

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

LIST OF ABBREVIATIONS

BAM Act:	*Biosecurity and Agriculture Management Act 2007* (WA)
BC Act:	*Biodiversity Conservation Act 2016* (WA)
BOM:	Bureau of Meteorology
DotEE:	Department of the Environment and Energy
DBCA:	Department of Biodiversity, Conservation and Attractions
DPaW:	Department of Parks and Wildlife (now under DBCA)
DPIRD:	Department of Primary Industries and Regional Development (includes Agriculture and Food)
EP Act:	*Environmental Protection Act 1986* (WA)
EPA:	Environmental Protection Authority
EPBC Act:	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
IBRA:	Interim Biogeographical Regionalisation for Australia
PEC:	Priority ecological community
TEC:	Threatened ecological community
WAH:	Western Australian Herbarium (PERTH)
WC Act:	*Wildlife Conservation Act 1950* (WA) (superseded by BC Act as of 01 January 2010)

EXECUTIVE SUMMARY

The following is a gap analysis of surveys undertaken to date at the Woodie Woodie Project and larger survey area between 2007 and 2019. This report summarises the flora surveys previously undertaken, the flora recorded or potentially occurring and the conservation significant flora recorded. The report reviews whether the surveys have met the current requirements under State and Federal guidance documents, including whether the flora and vegetation surveys have adequately covered the whole site, whether conservation significant taxa have been adequately surveyed, and identified any gaps in coverage of flora and vegetation surveys and addressed what survey work, if any, is required to fill any gaps in coverage.

Methodology

A desktop assessment was conducted using databases such as previous survey datasets; FloraBase, Protected Matters Search Tool (PMST), the NatureMap database and the Atlas of Living Australia. For each flora survey the following was summarised): Year and month of survey, Survey area, Survey type, Key Methods used and any conservation significant flora recorded. At each site the following environmental parameters were recorded: GPS location, local site topography; Soil type and colour; outcropping rocks and their type; percentage litter cover and percentage bare ground; approximate time since fire; and Vegetation condition

Survey Limitations

The majority of the surveys have been taken in April to June enabling coverage of the maximum range of flora values. Some years rainfall prior to the field work has been limited, as the work has been undertaken intensely and over multiple years this is not considered a limitation in achieving compliance.

All survey botanists were experienced with Pilbara flora. The surveys have covered the entire mining and corridor areas and as such was more than adequate. The survey plots comply with the 50m x 50m standard and replicates have been undertaken in all communities where possible. The adequacy of previous flora surveys was determined by comparing the surveys to the requirements set out in the current Guiding EPA documents

Desktop survey results

- **Location-** The Woodie Woodie Mine project area are located within the Interim Biogeographical Regionalisation for Australia Pilbara bioregion, and in particular within the Pilbara 1 (Chichester) subregion.
- **Geology, landforms and soils-** The survey area is situated within the Archaean Pilbara Craton which is overlain in the Woodie Woodie Mine area by Paleozoic sandstone of the Canning Basin. Rocky hills and stony plains dominate the landforms of the Pilbara region.
- **Land Systems**- Five systems were identified which intersect the project area. Generally they consist of rocky hills and slopes, stony plains with hard spinifex grasslands. The Paterson system is likely to be most impacted within the project area, with 0.98 % of its known extent falling within it.
- **Pre-European Vegetation Associations**- Three sub-associations were identified which intersect project area. These are low tree-steppe or shrub-steppe with Triodia spp. hummock grasslands with varying tree, mallee or shrub species. Vegetation sub-association 82.0 (low tree-steppe) has the most potential to be impacted within the project area, with 1.98 % of its known extent occurring within the project area.
- **Flora**- Based on database searched and previous mapping surveys in the area, fifteen priority taxa (no threatened taxa) were identified as having the potential to occur in the project area. Four of these species have been recorded in the Woodie Woodie project area in Mattiske surveys. Thirteen introduced flora taxa were identified as having the potential to occur in the project area and 17 had been recorded in previous surveys.

- **Vegetation**- No Ecological communities of conservation significance were identified during the desktop assessment. No World or National Heritage Areas, Ramsar Wetlands or National Parks and Reserves are situated within the proposed expansion areas.

Field survey results

- **Flora**- A total of 471 flora taxa from 56 families and 150 genera have been recorded on the Woodie Woodie lease areas since 2007.
- **Threatened and Priority Flora**- No threatened flora species, were recorded within the Woodie Woodie project area. *Lepidium amelum* (P1) was recorded in 2008 in the Greensnake lease area assessment. *Aristida jerichoensis* var. *subspinulifera* (P3), was recorded within the Mac Hill and Paystar surveys in 2007. *Euphorbia clementii* (P3), was recorded within the Area 6 survey area in 2019. In 2019, this species was recorded within Area 6 on the Woodie Woodie Mine Expansion areas. *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (P3) was recorded within the Eat tenements in May 2007.
- **Introduced (Weed) Species-** Seventeen introduced flora taxa have been recorded since 2007 on the Woodie Woodie lease areas. Declared Pest **Calotropis procera*, was recorded in 2019. **Aerva javanica* and **Cenchrus ciliaris* were the most widely distributed within the project area.
- **Vegetation Communities-** A total of 25 vegetation communities have been recorded within the Woodie Woodie area. None of which contained areas representative of TECs or PECs. The survey area contained creek lines, low hills and plains. Generally communities consisted of *Acacia* shrubs over *Triodia* species including; *Triodia epactia, Triodia longiceps* and *Triodia wiseana.* Creekline communities included *Eucalyptus victrix*, *Eucalyptus camaldulensis* and various *Corymbia* species, and open plain areas of Acacia shrubs such as *Acacia arida*, *Acacia bivenosa* and *Acacia synchronicia* over mixed grasses such as *Triodia epactia*, *Triodia longiceps* and *Triodia wiseana*.

Discussion

- **Flora and Vegetation-** The key values recorded from a conservation perspective include the four Priority species and the spatially restricted community (community unit 25). The comprehensive integration of desktop studies and recent field studies in the Mattiske Consulting Pty Ltd reports reflect the low range of flora and vegetation values of regional and national significance. It is recommended that further targeted studies on the four priority flora species be undertaken after more favourable seasonal conditions.
- **Compliance with Guidelines-** The previous and recent surveys have been compliant with the technical guidance statements. Although multiple seasons were not undertaken on all areas during the period from 2007 to 2019 the detailed nature of the studies in the multiple areas has enabled a detailed level of survey to be achieved.
- **Survey Effort-** Overall, the Woodie Woodie areas have been studied intensely at a detailed level with plot/quadrat/transect data, foot traverses and targeted searches for flora to enable comprehensive coverage of the lease areas including mining operations, expansion areas and infrastructure corridors. Further studies are unlikely to increase the knowledge of the areas as a significant proportion of the flora has been documented during the period from 2007 to 2019.

1. INTRODUCTION AND SCOPE

The following report is a Vegetation Gap Analysis of surveys undertaken to date at the Woodie Woodie Project and larger survey area between 2007 and 2019. The scope of this gap analysis was to:

- Summarise the flora surveys undertaken at Woodie Woodie, between 2007 and 2019.
- Summarise the flora recorded or potentially occurring at Woodie Woodie.
- List the conservation significant flora recorded, or potentially occurring.
- Comment on whether:
  - The flora and vegetation surveys meet current requirements under State and Federal guidance documents.
  - The flora and vegetation surveys have adequately covered the whole site.
  - Determine whether conservation significant taxa have been adequately surveyed.
- Identify any gaps in coverage of flora and vegetation surveys.
- Recommend what survey work, if any, is required to fill any gaps in coverage.

In undertaking this gap analysis it should be recognized that the community and regulatory expectations (EPA 2016a and 2016b) have changed and as such the presentation of datasets has altered during this reporting time (e.g. Levels 1 and 2 vs Reconnaissance and Detail Levels).

2. METHODS

2.1. Desktop Assessment

A desktop assessment of the ecological values of the proposed WWME was conducted using a range of literature and data sources. Databases accessed for desktop assessment data include:

- Previous datasets collected on the Woodie Woodie lease areas;
- FloraBase (WAH 1998-);
- The Commonwealth EPBC Act 1999 protected matters search tool (PMST) database (DotEE 2019(a));
- The Western Australian Department of Parks and Wildlife NatureMap database (Department of Parks and Wildlife 2007-); and
- Atlas of Living Australia (2019).

Database searches including NatureMap and the PMST incorporated a 40 km buffer from a centre point of the project area (UTM Zone 51K: 316750 mE, 7603929 mN). In addition to database searches, previous vegetation mapping surveys by Mattiske Consulting (2007a – 2007i; 2008a – 2008e; 2013, 2018, 2019a and 2019b) were reviewed to provide a potential species list for the Woodie Woodie mine area. Mattiske Consulting Pty Ltd has been undertaking field assessments since 2007 on the Woodie Woodie lease areas and subsequently the coverage of the area between 2007 and 2019 has been comprehensive and extensive. This work has been undertaken in various seasonal conditions from drier seasons to wetter seasons. For each flora survey the following was summarised):

- Year and month of survey.
- Survey area.
- Survey type.
- Key methods used.
- Any conservation significant flora recorded.

In view of the regularity of this work over multiple seasons including the majority of the assessments being undertaken in the April to June period following seasonal post cyclonic rains the timing of surveys has not been a limitation in the surveys.

2.2. Field Survey

Flora and vegetation were described and sampled systematically at each survey site, and additional opportunistic collections were undertaken wherever previously unrecorded plants were observed. At each site the following floristic and environmental parameters were recorded:

- GPS location (GDA94 datum, zone [51]);
- Local site topography;
- Soil type and colour;
- Outcropping rocks and their type;
- Percentage litter cover and percentage bare ground;
- Approximate time since fire; and
- Vegetation condition (based on [Keighery 1994 / Trudgen 1988])

All plant specimens collected during the field surveys were dried and processed in accordance with the requirements of the WAH. The plant species were identified based on taxonomic literature and through comparison with pressed specimens housed at the WAH. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

2.3. Survey Limitations

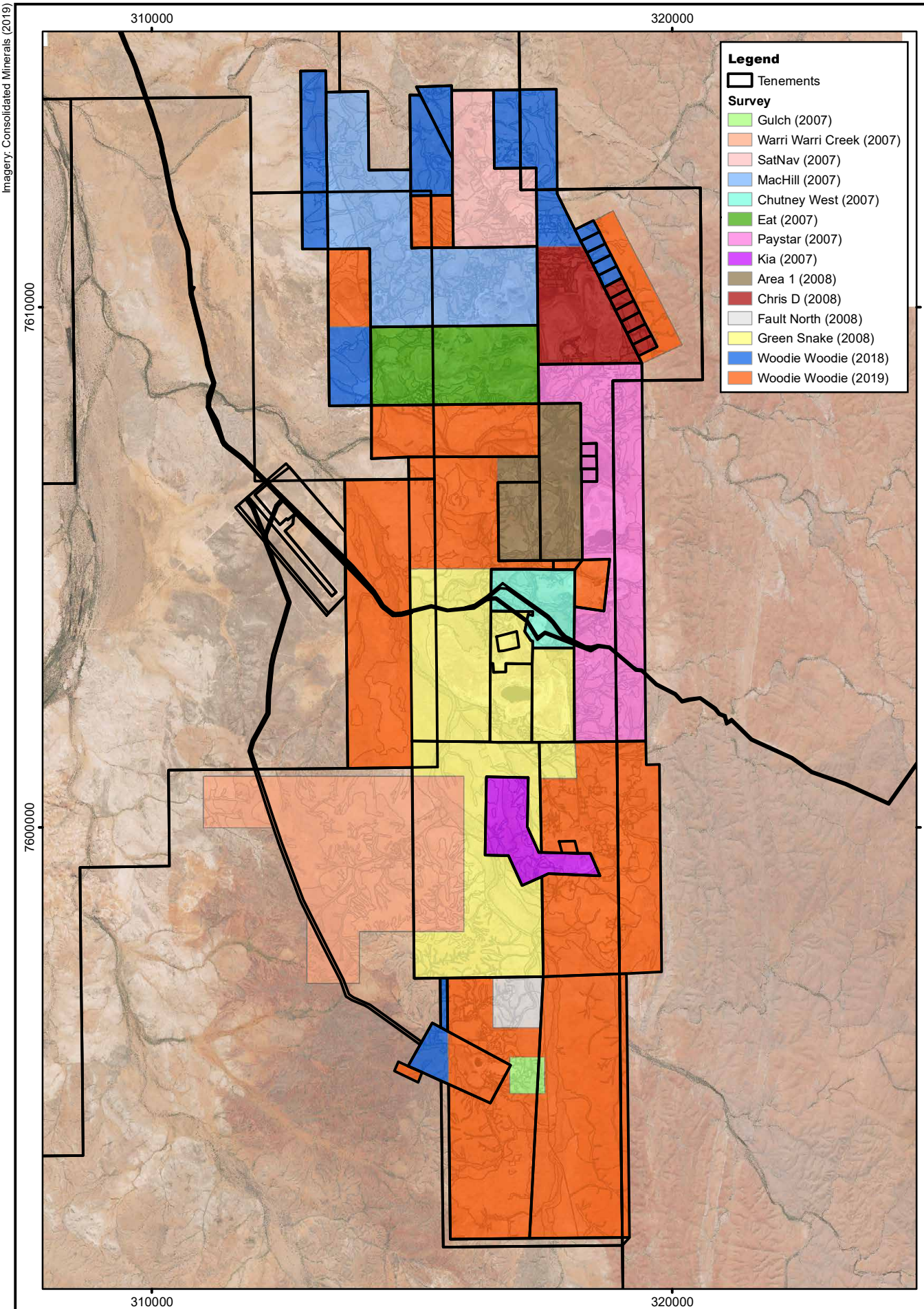
The assessment of survey adequacy was undertaken at a high level only, considering the following key questions:

- Were the surveys undertaken at the recommended time of year?
- Were the field botanists experienced with the Pilbara flora and vegetation?
- Did the surveys adequately cover the entire mine corridor?
- Did the surveys use the standard survey methods?

The assessment of survey adequacy was undertaken at a detailed level. The majority of the surveys have been taken in April to June (see Table 1 above for summary of survey times) enabling coverage of the maximum range of flora values. Whilst there have been some years where the rainfall prior to the field work has been limited, as the work has been undertaken intensely and also over multiple years on the lease areas this limitations is not seen as a major issue in achieving compliance. The botanists were experienced with the Pilbara flora and vegetation with experiences levels of team leaders exceeding 5 years of experience in the Pilbara. The survey covered the entire mining and corridor areas as such was more than adequate (see Figures 1 and 2). The survey plots have been complied with the 50m x 50m standard and also replicates have been undertaken in all communities, unless the community has been spatially restricted (e.g. community 25).

The adequacy of previous flora surveys was determined by comparing the surveys to the requirements set out in the following documents both pre-2016 and post-2016:

- Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. No 51. (EPA 2004)
- Environmental factor guideline – terrestrial flora and vegetation (EPA 2016a).
- Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b)
- Statement of environmental principles, factors and objectives (Environmental Protection Authority (EPA) 2018).



N

0 0.75 1.5 km

Scale: 1:100,000
MGA94 (Zone 51)

CAD Ref: a1415_WW_f14_01

Date: January 2020 | Rev: A | A4

Mattiske Consulting Pty Ltd

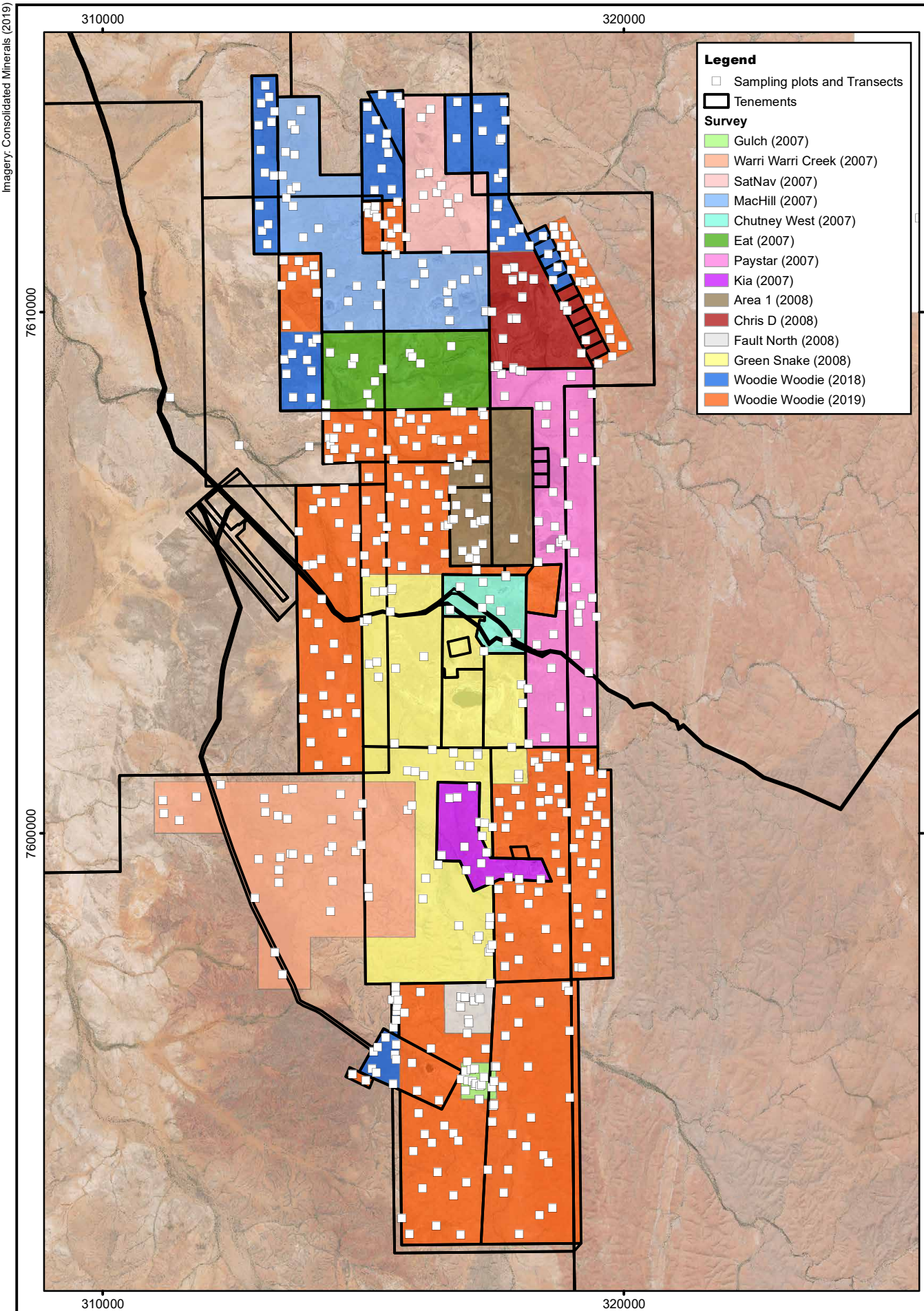
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref: MBS1904

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Woodie Woodie Gap Analysis
Survey Areas

Figure: 1



N

0 0.75 1.5 km

Scale: 1:100,000
MGA94 (Zone 51)

CAD Ref: a1415_WW_f14_02

Date: January 2020 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref: MBS1904
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Woodie Woodie Gap Analysis

Sampling plots and Transects

Figure: **2**

2.4. Summarising Flora Survey Results

The terrestrial flora and vegetation values were assessed against the current conservation categories and listings managed by the Department of Environment and Energy under the EPBC Act 1999 and the Department of Biodiversity and Conservation under the Biodiversity Conservation Act 2016, see Appendix A.

The interpretation of the likelihood of the conservation significant flora species occurring on the Woodie Woodie areas was based on information collated from State Herbarium records and knowledge of the Pilbara flora within the Mattiske team. This interpretation of the likelihood of potential species was updated to align with current listings, see Appendix B. The latter was required as the conservation status of some species has changed from the earlier assessments. Those species that have been recorded as conservation significant species were then extracted and summarized.

3. DESKTOP ASSESSMENT RESULTS

3.1. Location

The Woodie Woodie Mine project area are located within the Interim Biogeographical Regionalisation for Australia Pilbara bioregion, and in particular within the Pilbara 1 (Chichester) subregion. It is also within Beard's Fortescue Botanical District (Beard 1975, 1990), within the Eremaean Botanical Province. The findings of the desktop assessment are expanded further in the Mattiske Consulting Pty Ltd mapping survey in 2019 (2019a). The key findings are summarized below:

3.2. Geology, landforms and soils

The survey area is situated within the Archaean Pilbara Craton which is overlain in the Woodie Woodie Mine area by Paleozoic sandstone of the Canning Basin. Rocky hills and stony plains dominate the landforms of the Pilbara region. The project area falls within the Fortescue soil landscape province, which is mainly comprised of stony soils over hilly terrain, red shallow loams and sands elsewhere, with some clays on plains.

3.3. Land Systems

Five systems were identified which intersect the project area. Generally they consist of rocky hills and slopes, stony plains with hard spinifex grasslands. The Paterson system is likely to be most impacted within the project area, with 0.98 % of its known extent falling within it. This system is also likely the most prone to degradation by overgrazing and erosion.

3.4. Pre-European Vegetation Associations

Three sub-associations were identified which intersect project area. These are low tree-steppe or shrub-steppe with Triodia spp. hummock grasslands with varying tree, mallee or shrub species. Vegetation sub-association 82.0 (low tree-steppe) has the most potential to be impacted within the project area, with 1.98 % of its known extent occurring within it.

3.5. Flora

Based on database searched and previous mapping surveys in the area, fifteen priority taxa (no threatened taxa) were identified during the desktop survey as having the potential to occur in the project area (Appendix B). Four of these species have been recorded in the Woodie Woodie project area in Mattiske surveys. Thirteen introduced flora taxa were identified as having the potential to occur in the project area and 17 had been recorded in Mattiske surveys of The Woodie Woodie project area.

3.6. Vegetation

Flora and vegetation mapping in the Woodie Woodie mine area was carried out by Mattiske Consulting Pty Ltd from 2007-2019. Twenty-five vegetation communities were delineated on the basis of the mapping.

No Ecological communities of conservation significance were identified during the desktop assessment.

3.7. Other Matters of Conservation Significance

No World or National Heritage Areas, Ramsar Wetlands or National Parks and Reserves are situated within the proposed expansion areas; those nearby such as Karlamilyi National Park and Meentheena Station (70 and 50km away, respectively) are unlikely to be impacted by development project areas.

4. FIELD SURVEY RESULTS

4.1. Flora

A total of 471 flora taxa from 56 families and 150 genera have been recorded on the Woodie Woodie lease areas since 2007 (Appendix C).

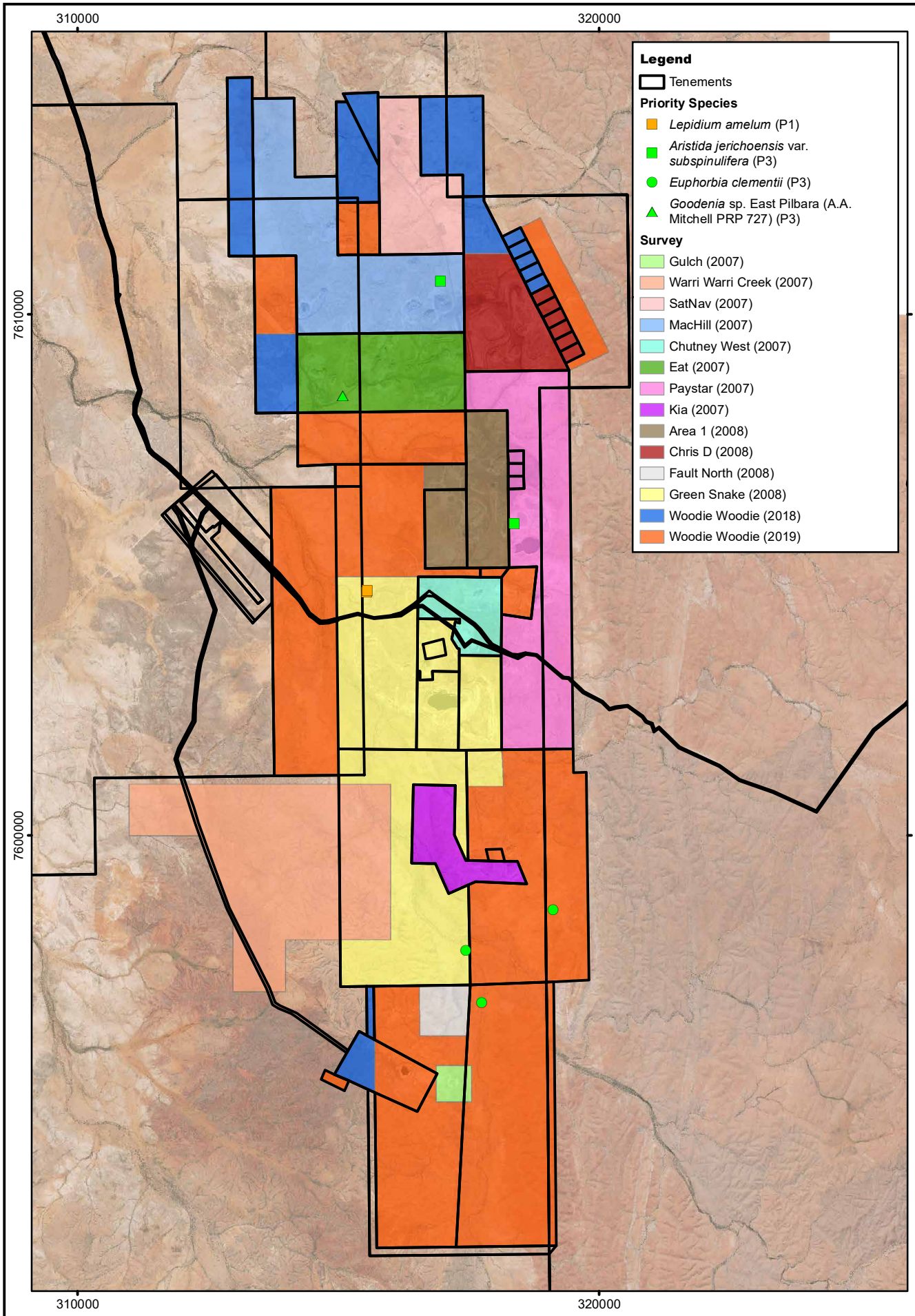
4.1.1. Threatened and Priority Flora

No threatened flora species pursuant to Part 2, Division 1, and Subdivision 2 of the *BC Act* and as listed by DBCA (2018), or pursuant to section 179 of the *EPBC Act* or listed by the DotEE (2019), were recorded within the Woodie Woodie project area.

The following Priority Flora species (Table 2) have been recorded on the Woodie Woodie lease areas (see Figure 3). Since the earlier survey efforts two of the previously recorded species (*Acacia glaucocaesia* and *Tephrosia* sp. Cathedral Gorge (F.H. Mollemans 2420), have been re-classified and are no longer Priority species, namely:

- *Acacia glaucocaesia,* a former Priority 3 species has been recorded in the past by Mattiske Consulting Pty Ltd botanists as part of the surveys. This species is no longer a Priority species (DBCA Florabase 2019) and is currently known from 44 records at the State Herbarium.

- *Tephrosia* sp. Cathedral Gorge (F.H. Mollemans 2420), a former Priority 3 species, has been renamed *Tephrosia oxalidea* which is not a Priority flora species. This species (DBCA Florabase 2019) is currently known from 23 records at the State Herbarium.



N

0 0.75 1.5 km

Scale: 1:100,000
MGA94 (Zone 51)

CAD Ref: a1415_WW_f14_03

Date: January 2020 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref: MBS1904
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Woodie Woodie Gap Analysis
Priority Flora locations

Figure: **3**

Table 1: Summary of Flora and Vegetation Surveys 2007 to 2019

Note – *Acacia glaucocaesia* has been delisted as a Priority species and also *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) changed listing from Priority 1 to Priority 3 since earlier studies (DBCA Florabase 2019) *Tephrosia* sp. Cathedral Gorge (F.H. Mollemans 2420) has been identified as *Tephrosia oxalidea* which is not a Priority species (DBCA Florabase 2019)

Survey Date	Survey Area	Tenements	No. Quadrats	Foot Traverses	Level of Assessment	Conservation Significant Species (SCC)	Vegetation Communities
March and May 2007	Gulch	M46/435	21	Yes	Detailed	No Threatened or Priority Flora	5 communities No TEC or PEC communities
May and June 2007	Warri Warri Creek	E46/513	37	Yes	Detailed	No Threatened or Priority Flora	7 communities No TEC or PEC communities
May and June 2007	Sat/Nav	M45/429	18	Yes	Detailed	No Threatened Flora One Priority Flora - *Aristida jerichoensis* var. *subspinulifera* (Priority 3)	8 communities No TEC or PEC communities
May and June 2007	Mac Hill	M45/430	35	Yes	Detailed	No Threatened or Priority Flora	9 communities No TEC or PEC communities
May 2007	Chutney West	M45/433	10	Yes	Detailed	No Threatened or Priority Flora	6 communities No TEC or PEC communities
May 2007	Eat	M45/431	14	`Yes	Detailed	No Threatened Flora One Priority Flora – Priority 3 – *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727)	10 communities No TEC or PEC communities
May 2007	Paystar	M45/638	41	Yes	Detailed	No Threatened Flora One Priority Flora - *Aristida jerichoensis* var. *subspinulifera* (Priority 3) Priority 3	9 communities No TEC or PEC communities
May and June 2007	Kia	M46/93	12	Yes	Detailed	No Threatened or Priority Flora	6 communities No TEC or PEC communities
April 2008	Area 1	M45/432, M45/517 and M45/637	17	Yes	Detailed	No Threatened or Priority Flora	9 communities No TEC or PEC communities

Table 1: Summary of Flora and Vegetation Surveys 2007 to 2019 (Continued)

Survey Date	Survey Area	Tenements	No. of Quadrats	Foot Traverses	Level of Assessment	Conservation Significant Species (SCC)	Vegetation
April and October 2008	Chris D	M45/639, G45/279, G45/280, G45/281, G45/282, G45/283 and G45/284	20	Yes	Detailed	No Threatened or Priority Flora	8 communities No TEC or PEC communities
October 2008	Fault North	M46/383	8	Yes	Detailed	No Threatened or Priority Flora	5 communities No TEC or PEC communities
October 2008	Greensnake	M45/637, M45/107, M46/108, M46/92, M46/137, M46.162, M46/161	37	Yes	Detailed	No Threatened Flora One Priority Flora – *Lepidium amelum* (Priority 1)	8 communities No TEC or PEC communities
June 2018	Woodie Woodie expansion	M45/641, M45/602, M45/1115, M45/640, M45/639, M45/1218, E45/4991, P46/1870 and M46/150	73	Yes	Detailed	No Threatened or Priority Flora	25 communities No TEC or PEC communities
June and August 2019	Woodie Woodie expansion and GDE survey	M45/640-I, M45/1218-I, E45/2470-I, M45/600-I, M45/637-I, G45/40, M45/601-I, E45/3548, G46/5, G46/4, M46/162-I, M46/150-I, M46/383-I and M46/384-I	255	Yes	Detailed	No Threatened Flora One Priority Flora – *Euphorbia clementii* (Priority 3)	25 communities No TEC or PEC communities

Table 2: Summary of Priority Flora Species recorded on the Woodie Woodie lease areas, 2007 to 2019

Note: SCC – State Conservation Code and FCC – Federal Conservation Code

Species	SCC	FCC	State Herbarium Records No.
Lepidium amelum	P1	-	7
Aristida jerichoensis var. *subspinulifera*	P3	-	39
Euphorbia clementii	P3	-	28
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	P3	-	38

Lepidium amelum, a Priority 1 species was recorded in 2008 by Mattiske Consulting Pty Ltd botanists as part of the Greensnake lease area assessment. This species is an erect, spreading shrub, 0.3-1 m high. This species occurs often on sandy loams & stony, calcareous, alkaline soils within hummock grassland, low open woodlands and disturbed areas. This species is known from 7 areas within the State Herbarium; mainly to the north-east of Newman on the fringes of the Pilbara Region (DBCA Florabase records, 2019).

Aristida jerichoensis var. *subspinulifera,* a Priority 3 species, was recorded within the survey area within the Mac Hill and Paystar surveys in 2007 by the Mattiske Consulting teams. This species is a compacted tufted perennial grass-like or herb, 03.to 0.8m high. This species tends to occur on hardpan plains. In 2007, this species was recorded at two sites on the Woodie Woodie lease areas. This species is known from a range of locations mainly in the southern areas of the Pilbara Region and extending slightly south of the Pilbara Region (DBCA Florabase records, 2019).

Euphorbia clementii, a Priority 3 species, was recorded within the survey area within Area 6 of the recent survey area (Mattiske Consulting Pty Ltd 2019a). This species is an erect herb, occurring on gravelly/stony ground on hillsides. This species was recognized previously as having the potential to occur in the survey areas (Mattiske Consulting Pty Ltd). In 2019, this species was recorded at three sites within Area 6 on the Woodie Woodie Mine Expansion areas. This species is known from a range of locations mainly in the northern areas of the Pilbara Region.

Goodenia sp. East Pilbara (A.A. Mitchell PRP 727) was recorded as a Priority 1 species within the Eat tenements by Mattiske Consulting Pty Ltd in May 2007. This species is an erect annual, or biennial, herb, which grows to 0.2 m high on low undulating plains. This species is now listed as a Priority 3 species (DBCA Florabase 2019). This species is known from 38 records at the State Herbarium and as such has been recorded in areas east and west of Newman and also north-east of Newman (DBCA Florabase records, 2019).

The combined flora and vegetation datasets have been merged and supplied in an ISBA format (see attached file).

There has been a relatively low range of threatened or priority flora species recorded and the in view of the level of survey effort in both plots/ quadrats and transects the flora values have been covered well over the period from 2007 to 2019. This statement is reinforced by the experience level of the team members with the Pilbara flora and vegetation and also the extent of the foot traverses and plots over this 12 year period. While further survey work would undoubtedly add a few species to the list of those known to occur, the majority of species have already been recorded.

4.1.2. Introduced (Weed) Species and Declared Pest (Plant) Organisms

Seventeen introduced flora taxa have been recorded since 2007 on the Woodie Woodie lease areas. Thirteen introduced species were recorded in 2019 (Mattiske Consulting Pty Ltd 2019a), of which one, **Calotropis procera*, was a Declared Pest pursuant to section 22 of the BAM Act 2007 according to the DPIRD (2019). The establishment of *Calotropis procera* will need to be controlled and managed this species as it has been aggressive on other sites. Of the remaining 16 permitted introduced species, **Aerva javanica* and **Cenchrus ciliaris* were the most widely distributed and dominant within the project area.

4.2. Vegetation

4.2.1. Vegetation Communities

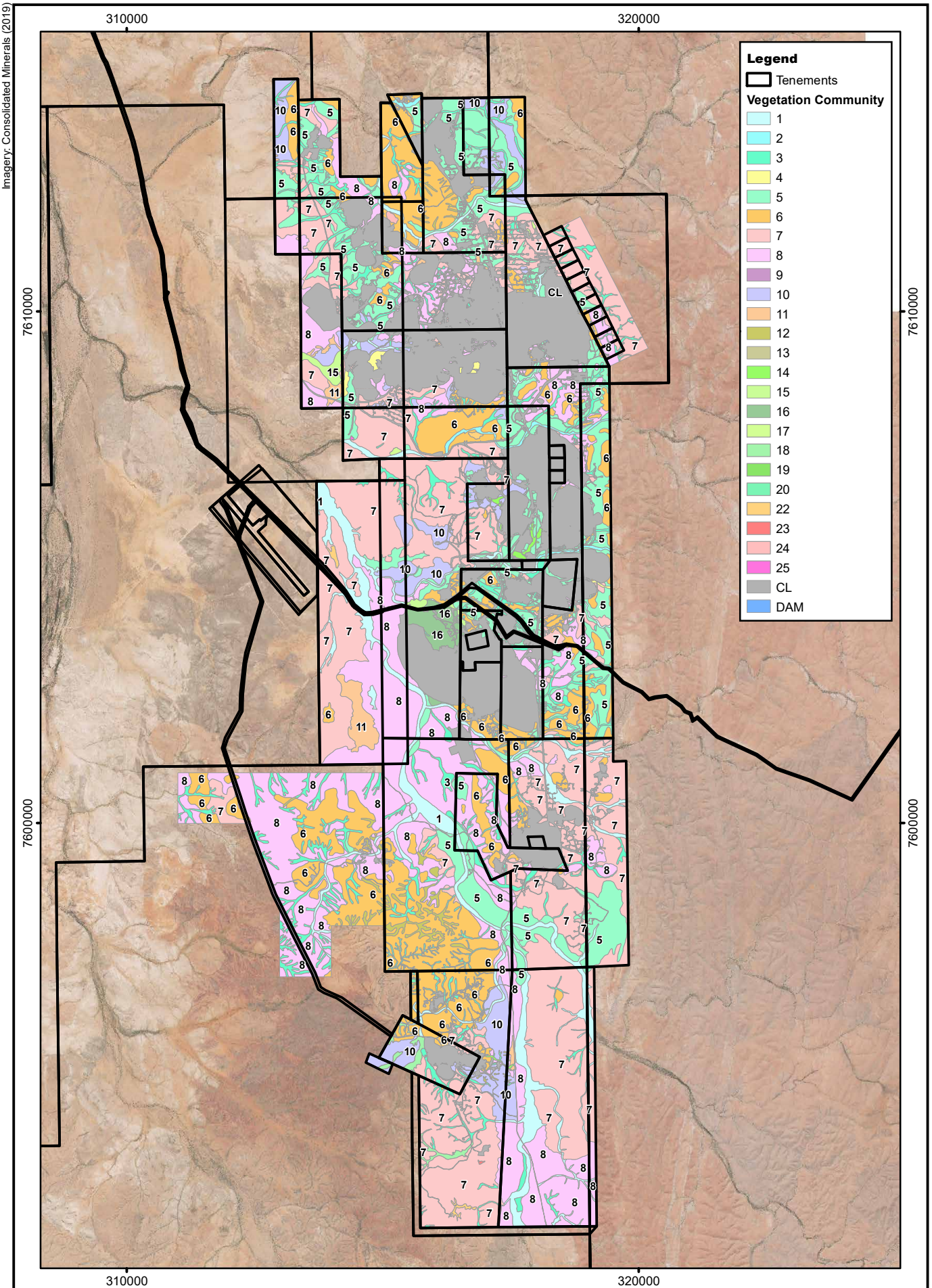
A total of 25 vegetation communities have been recorded within the Woodie Woodie area, Figure 4 as attached. None of these communities contained areas representative of TECs or PECs.

Table 3: Summary of Vegetation Communities recorded on the Woodie Woodie Lease areas

MATTISKE VEGETATION CODE	VEGETATION DESCRIPTION
1	*Eucalyptus victrix* and *Eucalyptus camaldulensis* mid open woodland, over *Acacia coriacea* subsp. *pendens*, *Atalaya hemiglauca* and *Acacia trachycarpa* tall sparse shrubland, over *Cyperus vaginatus* low sparse sedgeland, over **Cenchrus ciliaris* mid grassland on red-brown sandy loam along major watercourses.
2	*Eucalyptus victrix* mid open woodland, over *Atalaya hemiglauca*, *Petalostylis labicheoides* and *Acacia trachycarpa* tall sparse shrubland, over **Cenchrus ciliaris* mid tussock grassland on red-brown clay on flats, minor drainage channels and associated with major watercourses.
3	*Corymbia hamersleyana* low isolated trees, over *Petalostylis labicheoides*, *Acacia ancistrocarpa* and *Grevillea wickhamii* tall sparse shrubland, over *Triodia longiceps* mid sparse hummock grassland and **Cenchrus ciliaris* mid sparse tussock grassland on red-brown sand/clay/loam, sometimes with gravel, on flats and minor watercourses.
5	*Acacia arida*, *Acacia bivenosa* and *Acacia synchronicia* tall sparse shrubland, over *Triodia longiceps*, *Triodia wiseana* and *Triodia basedowii* mid open hummock grassland and patches of **Cenchrus ciliaris* and *Sporobolus australasicus* low open grassland on red sand and clay loam on flats, occasionally associated with watercourses.
6	*Corymbia aspera* and *Corymbia hamersleyana* low isolated trees, over *Hakea lorea* and *Acacia inaequilatera* tall isolated shrubs, over *Triodia wiseana*, *Triodia basedowii* and *Triodia longiceps* mid open hummock grassland on red-brown clay and loam with gravel on slopes and hilltops.
7	*Acacia synchronicia*, *Acacia bivenosa* and *Acacia arida* tall sparse shrubland, over *Triodia longiceps*, *Triodia wiseana* and *Triodia pungens* mid open hummock grassland on orange-red loam, clay loam, sandy loam on flats and lower slopes.
8	*Hakea lorea* low isolated trees, over *Acacia bivenosa*, *Acacia arida* and *Acacia synchronicia* mid sparse shrubland, over *Triodia wiseana* and *Triodia longiceps* mid sparse hummock grassland and **Cenchrus ciliaris* mid sparse tussock grassland on brown clay and loam with rocks and pebbles on hills and slopes.
10	*Corymbia hamersleyana* low open woodland, over *Acacia bivenosa*, *Acacia arida* and *Grevillea wickhamii* tall sparse shrubland, over *Triodia wiseana*, *Triodia basedowii* and *Triodia pungens* mid open hummock grassland on red-brown clay/sand/loam, with some gravel, on undulating plains and slopes.
11	*Acacia bivenosa* and *Acacia trachycarpa* tall isolated shrubs, over *Maireana* sp. and *Eremophea spinosa* low sparse shrubland, over **Cenchrus ciliaris* and *Sporobolus australasicus* mid sparse grassland on pale red/brown clayey flats.

Table 3: Summary of Vegetation Communities recorded on the Woodie Woodie Lease areas (continued)

MATTISKE VEGETATION CODE	VEGETATION DESCRIPTION
12	*Open Scrub of Senna artemisioides subsp. oligophylla, Hakea lorea subsp. lorea and Atalaya hemiglauca over mixed shrubs, herbs and grasses on rocky slopes.*
13	*Thicket of Acacia ancistrocarpa, Acacia bivenosa and Senna artemisioides subsp. oligophylla over mixed small shrubs and Triodia spp. on rehabilitation areas.*
14	*Open Low Woodland of Atalaya hemiglauca with Corymbia hamersleyana over Corchorus lasiocarpus subsp. lasiocarpus, *Aerva javanica, Eriachne mucronata and Triodia epactia on minor watercourses.*
15	*Closed Sedgeland of Typha domingensis, with Cyperus vaginatus on flats.*
16	*Hummock Grassland of Triodia basedowii with Petalostylis labicheoides, Acacia arida, Grevillea wickhamii subsp. hispidula and Hakea lorea subsp. lorea on undulating slopes.*
17	*Acacia synchronicia, Acacia bivenosa and Grevillea wickhamii tall sparse shrubland, over Triumfetta maconochieana, Hibiscus coatesii and Cleome viscosa low sparse shrubland, over Triodia pungens and Triodia wiseana mid sparse hummock grassland and Eriachne mucronata mid sparse tussock grassland on red clay and loam on rocky outcrops.*
18	*Corymbia hamersleyana and Corymbia aspera low open woodland, over Acacia arida, Acacia ancistrocarpa and Acacia tumida tall open shrubland, over Triodia pungens and Triodia wiseana on hummock grassland on clayey soils on flats and drainage channels.*
19	*Acacia tumida, Grevillea wickhamii and Petalostylis labicheoides tall shrubland, over Triodia wiseana and Triodia pungens mid open hummock grassland along minor gullies.*
20	*Corymbia aspera and Corymbia hamersleyana low open woodland, over Eremophila exilifolia, Acacia arida and Tribulus suberosus mid sparse shrubland, over Eriachne ciliata low isolated grasses on stony hilltops.*
21	*Corymbia aspera and Corymbia hamersleyana low open woodland, over Acacia tumida, Petalostylis labicheoides and Grevillea wickhamii mid open shrubland, over Triodia pungens and Triodia wiseana mid open hummock grassland and Eulalia aurea mid sparse grassland along major watercourses.*
22	*Acacia sclerosperma subsp. sclerosperma tall open shrubland over Acacia bivenosa mid isolated clumps of shrubs over Triodia epactia and Eulalia aurea sparse grassland on red clayey or sandy soil associated with minor drainage lines.*
23	*Eucalyptus leucophloia subsp. leucophloia low isolated clumps of trees over Triodia longiceps and Eriachne mucronata open grassland on skeletal, stony orange soil on breakaways and upper slopes.*
24	*Corymbia candida mid open woodland over Acacia arida mid sparse shrubland over Triodia epactia and Triodia wiseana open hummock grassland on orange rocky clayey loam and sandy loam on stony hilltops.*
25	*Typha domingensis tall open forbland over Cyperus vaginatus open sedgeland over Triodia wiseana and Triodia longiceps sparse hummock grassland on grey-orange clay with pebbles on flats with permanent inundation.*



N

0 0.75 1.5 km

Scale: 1:100,000
MGA94 (Zone 51)

CAD Ref: a1415_WW_f14_04

Date: January 2020 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref: MBS1904
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Woodie Woodie Gap Analysis
Vegetation

Figure: **4**

The vegetation communities present occurred on a range of different associated soils and landforms, the survey area contained creek lines, low hills and plains to the north and large expanse of steep rocky hills bounding the south. These landforms were mostly associated with gravel over orange brown clay loam soils supporting *Acacia* shrubs over different species of *Triodia* including; *Triodia epactia, Triodia longiceps* and *Triodia wiseana.* Creekline communities consisted of broad systems which include *Eucalyptus victrix*, *Eucalyptus camaldulensis* and various *Corymbia* species through the associated gullies and drainage lines. Open plain areas generally consisted of Acacia shrubs such as *Acacia arida*, *Acacia bivenosa* and *Acacia synchronicia* over mixed grasses such as *Triodia epactia*, *Triodia longiceps* and *Triodia wiseana*.

Most vegetation communities are well represented at a local, sub regional and regional scale, with the exception of one community type, community 25, which occurs only once throughout the Woodie Woodie lease areas. Community 25 contains *Typha domingensis* over *Cyperus vaginatus* and mixed *Triodia* species. This community is located at the current discharge point for mine dewatering at Woodie Woodie, creating an environment with high soil moisture levels, differentiating this site from all other survey sites which are generally drier (Mattiske Consulting Pty Ltd (2019a, 2019b).

5. DISCUSSION

5.1. Compliance with Guidelines

The previous and recent surveys have been compliant with the technical guidance statements (EPA 2004, 2016a and 2016b). Although multiple seasons were not undertaken on all areas during the period from 2007 to 2019 the detailed nature of the studies in the multiple areas has enabled a detailed level of survey to be achieved.

5.2. Survey Effort

Overall, the Woodie Woodie areas have been studied intensely at a detailed level with plot/quadrat/transect data, foot traverses and targeted searches for flora to enable comprehensive coverage of the lease areas including mining operations, expansion areas and infrastructure corridors. Further studies are unlikely to increase the knowledge of the areas as a significant proportion of the flora has been documented during the period from 2007 to 2019.

5.3. Flora and Vegetation

The key values recorded from a conservation perspective include the four Priority species as illustrated on Figure 3 and the spatially restricted community (community unit 25), Figure 4. The comprehensive integration of desktop studies and recent field studies in the Mattiske Consulting Pty Ltd (2019a and 2019b) reports reflect the low range of flora and vegetation values of regional and national significance. The priority flora and the restricted vegetation community are mainly local and to some degree regional values that require management.

It is recommended that further targeted studies on the four priority flora species be undertaken after more favourable seasonal conditions.

6. ACKNOWLEDGEMENTS

The authors would like to thank Jonathan Barker from MBS Environmental and Sarah Thomas from Consolidated Minerals for their assistance with this project. The authors would also like to thank taxonomists from the Western Australian Herbarium for their plant identification support.

7. PERSONNEL

The following Mattiske Consulting Pty Ltd personnel were involved in this project:

NAME	POSITION	PROJECT INVOLVEMENT	FLORA COLLECTION PERMITS
Dr EM Mattiske	Managing Director & Principal Ecologist	Planning, managing, editing, reporting	N/A
L Rowles	Experienced Botanist	Reporting, editing	N/A

8. REFERENCES

Beard, JS 1975, Vegetation Survey of Western Australia – Pilbara, 1:1,000,000 Vegetation Series – Explanatory notes to sheet 5, University of Western Australia Press, Nedlands, Western Australia.

Beard, JS 1990, Plant Life of Western Australia. Kangaroo Press, Kenthurst NSW.

Department of Biodiversity, Conservation and Attractions 2018, Threatened and Priority Flora List – 05 December 2018. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants. 03 October 2019.

Department of the Environment and Energy 2019, EPBC Act List of Threatened Flora. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora. 03 August 2019.

Department of Primary Industries and Regional Development 2019, Western Australian Organism List. Available from: https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol. 03 October 2019.

Environmental Protection Authority (2004)

Environmental Protection Authority 2016a, Environmental Factor Guideline - Flora and Vegetation, Environmental Protection Authority, Perth, WA.

Environmental Protection Authority 2016b, Technical Guidance – Flora and vegetation surveys for environmental impact assessment, Environmental Protection Authority, Western Australia.

Environmental Protection Authority 2018, Statement of environmental principles, factors and objectives, Environmental Protection Authority, Western Australia.

Kendrick, P 2001, 'Great Sandy Desert 2 (GSD2 – Mackay subregion)' in: A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002, eds. JE May & NL McKenzie, Department of Conservation and Land Management, Western Australia, pp. 332-342.

Kendrick, P and McKenzie, N 2001, 'Pilbara 1 (PIL1 – Chichester subregion)', in: A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002, eds. JE May & NL McKenzie, Department of Conservation and Land Management, Western Australia, pp. 547-558.

Mattiske Consulting Pty Ltd 2007a, Flora and vegetation Survey of Tenement M46/435 (including the Gulch Prospect), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, August 2007.

Mattiske Consulting Pty Ltd 2007b, Flora and vegetation survey of tenement M46/513 Warri Warri Creek, Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007c, Flora and vegetation survey of tenement M45/429 (including Sat/Nav and Radio Hill deposits), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007d, Flora and vegetation survey of tenement M45/430 (including Big Mac, Ghost Hunter, Sardine, Topvar and Whodowe prospects), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007e, Flora and vegetation survey of the Eat tenement, Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007f, Flora and Vegetation Survey of Tenement M45/433 (including Chutney West Deposit), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Pty Ltd, August 2007.

Mattiske Consulting Pty Ltd 2007g, Flora and vegetation survey of the tenement M45/638 (including Camp East, Paystar and Vespa prospects), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007h, Flora and vegetation survey of the tenement M46/93 (including Kia deposit), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2007i, Flora and vegetation survey of tenement M46/435 (including the Gulch Prospect), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, October 2007.

Mattiske Consulting Pty Ltd 2008a, Flora and vegetation survey of tenements M45/432, M45/517 and M45/637 (including Area 1 prospect), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, September 2008.

Mattiske Consulting Pty Ltd 2008b, Flora and vegetation survey of Chris D tenement - M45/639, Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, September 2008.

Mattiske Consulting Pty Ltd 2008c, Flora and vegetation survey of Fault North tenement - M45/383 (Part), Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, December 2008.

Mattiske Consulting Pty Ltd 2008d, Flora and vegetation survey of Greensnake tenements M45/637, M45/107, M46/108, M46/92, M46/137, M46/162 & M46/161, Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, December 2008.

Mattiske Consulting Pty Ltd 2008e, An updated Flora and vegetation survey of Chris D tenements M45/639, G45/279, G45/280, G45/281, G45/282, G45/283 and G45/284, Woodie Woodie. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, December 2008.

Mattiske Consulting Pty Ltd 2013, Flora and Vegetation of the Woodie Woodie South and Max Prospects. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, April 2013.

Mattiske Consulting Pty Ltd 2018, Detailed Flora and Vegetation Assessment Woodie Woodie Project Expansion Area Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, August 2018.

Mattiske Consulting Pty Ltd 2019a, Flora and Vegetation Assessment Woodie Woodie Minesite Expansion. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, December 2019.

Mattiske Consulting Pty Ltd 2019b, Flora and Vegetation Assessment Woodie Woodie Minesite Expansion. Groundwater Dependent Ecosystems Survey. Unpublished report prepared for MBS Environmental on behalf of Consolidated Minerals Limited, December 2019.

Shepherd, DP, Beeston, GR & Hopkins, AJM 2002, Native vegetation in Western Australia – extent, type and status. Resource management technical report 249, Department of Agriculture, Western Australia.

Thackway, R and Cresswell, ID 1995, An interim biogeographic regionalisation for Australia - a framework for establishing the national system of reserves. Australian Nature Conservation Agency, Canberra, Australian Capital Territory.

Tille, P 2006, Soil-landscapes of Western Australia's Rangelands and Arid Interior, Resource Management Technical Report 313, Department of Agriculture, Western Australia.

APPENDIX A1: THREATENED AND PRIORITY FLORA DEFINITIONS

Under section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), **threatened flora** are categorised as extinct, extinct in the wild, critically endangered, endangered, vulnerable and conservation dependent (Table A1.1).

Table A1.1 Federal definition of threatened flora species

Note: Adapted from section 179 of the EPBC Act.

CODE	CATEGORY	DEFINITION
Ex	**Extinct**	Species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild**	Species which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered**	Species which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered**	Species which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable**	Species which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent**	Species which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

The *Biodiversity Conservation Act 2016* (BC Act) provides for (amongst other things) the protection of flora that is facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future in Western Australia under Part 10 (Division 2).

Threatened flora are listed in the *Wildlife Conservation (Rare Flora) Notice 2018* (under Part 2, Division 1, Subdivision 2 of the BC Act; Department of Biodiversity, Conservation and Attractions ([DBCA] 2018a) and are categorised under Schedules 1-3**.** A flora species is defined as **threatened** if it is facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future, pursuant to sections 20, 21 and 22 of the BC Act (DBCA 2019c). Threatened species are categorised as critically endangered, endangered, and vulnerable (Table A1.2).

Table A1.2 State definition of threatened flora species

Note: Adapted from DBCA (2019c).

CODE	CATEGORY	DEFINITION
CR	**Critically endangered**	Species considered to be facing an extremely high risk of becoming extinct in the wild (listed under Schedule 1 of the *Wildlife Conservation (Rare Flora) Notice 2018*).
EN	**Endangered**	Species considered to be facing a very high risk of becoming extinct in the wild (listed under Schedule 2 of the *Wildlife Conservation (Rare Flora) Notice 2018*).
VU	**Vulnerable**	Species considered to be facing a high risk of becoming extinct in the wild (listed under Schedule 3 of the *Wildlife Conservation (Rare Flora) Notice 2018*).
EX	**Presumed extinct species**	Species that have been adequately searched for and there is no reasonable doubt that the last individual has died (listed under Schedule 4 of the *Wildlife Conservation (Rare Flora) Notice 2018*).

Priority flora species are defined as "possibly threatened species that do not meet the survey criteria, or are otherwise data deficient" or species that are "adequately known, are rare but not threatened, meet criteria for near threatened or have recently been removed from the threatened species list" for other than taxonomic reasons" (DBCA 2019c). **Priority species are not afforded the same level of protection under state or federal legislation as the listed Threatened species**, however are considered significant under the Environmental Protection Authority's *Environmental Factor Guideline: Flora and Vegetation*. The DBCA categorises priority flora into four categories: Priority 1; Priority 2, Priority 3 and Priority 4 (Table A1.3).

Table A1.3: State definition of priority flora species

Note: Adapted from DBCA (2019c).

CODE	CATEGORY	DEFINITION
P1	**Priority 1:** Poorly-known species	Known from one or a few locations (< 5) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation; or are otherwise under threat of habitat destruction or degradation. In urgent need of further survey.
P2	**Priority 2:** Poorly-known species	Known from one or a few locations (< 5). Some occurrences are on lands managed primarily for nature conservation. In urgent need of further survey.
P3	**Priority 3:** Poorly-known species	Known from several locations and the species does not appear to be under imminent threat; or from few but widespread locations with either a large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. In need of further survey.
P4	**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 do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. **c) Other -** Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

APPENDIX A2: THREATENED AND PRIORITY ECOLOGICAL COMMUNITY DEFINITIONS

Under section 181 of the EPBC Act, **threatened ecological communities** are categorised as critically endangered, endangered and vulnerable (Table A2.1).

Table A2.1 Federal definition of threatened ecological communities

Note: Adapted from section 181 and section 182 of the EPBC Act.

CATEGORY	DEFINITION
Critically Endangered	If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.
Vulnerable	If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future.

Threatened ecological communities (TECs) are listed in the *List of Threatened Ecological Communities endorsed by the Western Australian Minister for Environment (28 June 2018)* (under Part 2, Division 2, Subdivision 1 of the BC Act; DBCA 2018c). An ecological community is defined as **threatened** if it is facing an extremely high risk of collapse in the immediate, near or medium-term future, pursuant to sections 28, 29 and 30 of the BC Act. Threatened ecological communities are categorised as critically endangered, endangered, and vulnerable (Table A2.2).

Currently there is no Western Australian legislation covering the conservation of state listed **threatened ecological communities** (TECs), however, a non-statutory process is in place, whereby the DBCA (and former equivalent departments) have been identifying and informally listing TECs since 1994. Some of these TECs are endorsed by the Federal Minister as threatened, and some of these are also listed under the EPBC Act and therefore afforded legislative protection at the Commonwealth level.

Table A2.2 State definition of threatened ecological communities

Note: Adapted from Department of Environment and Conservation (2013).

CODE	CATEGORY	DEFINITION
PD	**Presumed Totally Destroyed**	An ecological community will be listed as PD if there are no recent records of the community being extant **and either** of the following applies: **1.** Records within the last 50 years have not been confirmed despite thorough searches or known likely habitats; or **2.** All occurrences recorded within the last 50 years have since been destroyed.
CR	**Critically Endangered**	An ecological community will be listed as CR when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting **any one or more of** the following criteria: **1.** The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification; **2.** The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or **3.** The ecological community is highly modified with potential of being rehabilitated in the immediate future.
EN	**Endangered**	An ecological community will be listed as EN when it has been adequately surveyed and is not CR, but is facing a very high risk of total destruction in the near future. The ecological community must meet **any one or more of** the following criteria: **1.** The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification; **2.** The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or **3.** The ecological community is highly modified with potential of being rehabilitated in the short term future.
VU	**Vulnerable**	An ecological community will be listed as VU when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet **any one or more of** the following criteria: **1.** The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated; **2.** The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution; or **3.** The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.

Priority ecological communities (PECs) are defined as possible threatened ecological communities that do not meet the stringent survey criteria for the assessment of threatened ecological communities, and are listed by the DBCA (2019a) in the *Priority Ecological Communities for Western Australia – Version 28 (17 January 2019)*. Similarly to priority flora, PECs are not afforded the same level of legislative protection as the TECs, however are considered significant under the Environmental Protection Authority's (2016a) *Environmental Factor Guideline: Flora and Vegetation*. The DBCA categorises priority ecological communities into five categories: Priority 1; Priority 2, Priority 3, Priority 4 and Priority 5 (Table A2.3).

Table A2.3 State definition of priority ecological communities

Note: Adapted from Department of Environment and Conservation (2013).

CODE	CATEGORY	DEFINITION
P1	**Priority 1** (Poorly known ecological communities)	Ecological communities that are known from very few, restricted occurrences (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Most of these occurrences are not actively managed for conservation (e.g. located within agricultural or pastoral lands, urban areas, or active mineral leases) and for which immediate threats exist.
P2	**Priority 2** (Poorly known ecological communities)	Communities that are known from few small occurrences (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation.
P3	**Priority 3** (Poorly known ecological communities)	**1.** 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; **2.** Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat; or **3.** Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.
P4	**Priority 4** (Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring)	**1.** Rare – Communities known from few occurrences that are considered to have been adequately surveyed, sufficient knowledge is available, and are considered not to be currently threatened. **2.** Near Threatened – Communities considered to have been adequately surveyed and do not qualify for Conservation Dependent, but are close to qualifying for Vulnerable. **3.** Communities that have been removed from the list of threatened communities during the past five years.
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.

APPENDIX A3: CATEGORIES AND CONTROL MEASURES OF DECLARED PEST (PLANT) ORGANISMS IN WESTERN AUSTRALIA

Section 22 of Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act) makes provision for a plant taxon to be listed as a declared pest organism in respect to parts of, or the entire State. According to the BAM Act, a declared pest is defined as a prohibited organism (section 12), or an organism for which a declaration under section 22 (2) of the Act is in force.

Under the *Biosecurity and Agriculture Management Regulations 2013* (WA), declared pest plants are placed in one of three control categories, C1 (exclusion), C2 (eradication) or C3 (management), which determines the measures of control which apply to the declared pest (Table A4.1). The current listing of declared pest organisms and their control category is through the Western Australian Organism List (Department of Primary Industries and Regional Development 2019).

Table A3.1 Categories and control measures of declared pest (plant) organisms

Note: Adapted from *Biosecurity and Agriculture Management Regulations 2013*.

CONTROL CATEGORY	CONTROL MEASURES
C1 (Exclusion) '(a) Category 1 (C1) — Exclusion: if in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented.' Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.	In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C2 (Eradication) '(b) Category 2 (C2) — Eradication: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible.' Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.	In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C3 (Management) '(c) Category 3 (C3) — Management: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to: **(i)** alleviate the harmful impact of the declared pest in the area; or **(ii)** reduce the number or distribution of the declared pest in the area; or **(iii)** prevent or contain the spread of the declared pest in the area.' Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.	In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to: **(a)** alleviate the harmful impact of the declared pest in the area for which it is declared; or **(b)** reduce the number or distribution of the declared pest in the area for which it is declared; or **(c)** prevent or contain the spread of the declared pest in the area for which it is declared.

APPENDIX A4: OTHER DEFINITIONS

Environmentally sensitive areas

Environmentally sensitive areas are declared by the State Minister under section 51B of the *Environmental Protection Act 1986* (EP Act) and are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, gazetted 8 April 2005. Specific environmentally sensitive areas relevant to this report include: a defined wetland and the area within 50 metres of the wetland; the area covered by vegetation within 50 metres of rare flora; the area covered by a threatened ecological community; a Bush Forever site – further areas and information are described in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

Conservation significant flora

Under the *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority 2016a), flora may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority species;
- locally endemic or associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; or
- relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Conservation significant vegetation

Under the *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority 2016a), vegetation may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority ecological communities;
- restricted distribution;
- degree of historical impact from threatening processes;
- a role as a refuge; or
- providing an important function required to maintain ecological integrity of a significant ecosystem.

APPENDIX A5: NVIS STRUCTURAL FORMATION TERMINOLOGY

Note: Adapted from Executive Steering Committee for Australian Vegetation Information (2003).

COVER CHARACTERISTICS							
Foliage cover*	70-100	30-70	10-30	<10	≈0	0-5	unknown
Crown cover**	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
% cover***	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
Cover code	d	c	i	r	bi	bc	unknown

GROWTH FORM	HEIGHT RANGES (m)	STRUCTURAL FORMATION CLASSES						
tree, palm	<10, 10-30, >30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
tree mallee	<3, <10, 10-30	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees	mallee trees
shrub, cycad, grass-tree, tree-fern	<1, 1-2, >2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
mallee shrub	<3, <10, 10-30	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs	mallee shrubs
heath shrub	<1, 1-2, >2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
chenopod shrub	<1, 1-2, >2	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs	chenopod shrubs
samphire shrub	<0.5, >0.5	closed samphire shrubland	samphire shrubland	open samphire shrubland	spare samphire shrubland	isolated samphire shrubs	isolated clumps of samphire shrubs	samphire shrubs
hummock grass	<2, >2	closed hummock grassland	hummock grassland	open hummock grassland	sparse hummock grassland	isolated hummock grasses	isolated clumps of hummock grasses	hummock grasses
tussock grass	<0.5, >0.5	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grassland	isolated clumps of tussock grasses	tussock grasses
other grass	<0.5, >0.5	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
sedge	<0.5, >0.5	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
rush	<0.5, >0.5	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
forb	<0.5, >0.5	closed forbland	forbland	open forbland	sparse forbland	isolated forbs	isolated clumps of forbs	forbs
fern	<1, 1-2, >2	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
bryophyte	<0.5	closed bryophyteland	bryophyteland	open bryophyteland	sparse bryophyteland	isolated bryophytes	isolated clumps of bryophytes	bryophytes
lichen	<0.5	closed lichenland	lichenland	open lichenland	sparse lichenland	isolated lichens	isolated clumps of lichens	lichens
vine	<10, 10-30, >30	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines
aquatic	0-0.5, <1	closed aquatic bed	aquatic bed	open aquatic bed	sparse aquatics	isolated aquatics	isolated clumps of aquatics	aquatics
seagrass	0-0.5, <1	closed seagrass bed	seagrass bed	open seagrass bed	sparse seagrasses	isolated seagrasses	isolated clumps of seagrasses	seagrasses

APPENDIX B: LIKELIHOOD OF CONSERVATION SIGNIFICANT PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE WOODIE WOODIE PROJECT AREA

Note: SCC denotes State Conservation Code (refer to Appendix A for definitions). IBRA Distribution: CAR– Carnarvon; CEK – Central Kimberley; DAL – Dampierland; GAS – Gascoyne; GID – Gibson desert; GSD – Great Sandy Desert; LSD – Little Sandy Desert; MUR – Murchison; OVP – Ord Victoria Plain; PIL – Pilbara; VIB – Victoria Bonaparte. Ranking of Likelihood of occurrence in survey area is on a Unlikely-Possible-Likely scale (see Section 2.1 for ranking criteria). Information from Florabase (WAH 1998-) and Atlas of Living Australia (2019).

Species	Family	SCC	Description and Habitat	Likelihood of Occurrence
Acacia fecunda	Fabaceae	P1	Description: Erect, obconic shrub to 3 m Habitat: Creeks, drainage lines and hills. Flower colour: Yellow Flowering period: May or August Soils: Quartzite gibbers over grey-red skeletal soil. IBRA Distribution: PIL Florabase records: 15	Possible
Acacia setulifera	Fabaceae	P1	Description: Shrub to 0.5 m Habitat: Amongst rocks Flower colour: Yellow Flowering period: February to August Soils: Shallow sand IBRA Distribution: VBP Florabase records: 3	Unlikely Only one nearby record (1891 – Atlas of Living Australia), other records all from northern Kimberley.
Goodenia pedicellata	Goodeniaceae	P1	Description: Singe-stemmed perennial herb to 0.25 m Habitat: Rocky slopes, crests of small hills. Flower colour: Yellow Flowering period: April to July Soils: Rocky clayey soils. IBRA Distribution: PIL Florabase records: 10	Possible
Lepidium amelum	Brassicaceae	P1	Description: Erect, spreading shrub to 1 m Habitat: Hummock grassland, low open woodland and disturbed sites. Flower colour: White Flowering period: May to August Soils: Sandy loams & stony, calcareous, alkaline soils. IBRA Distribution: PIL Florabase records: 7	Possible
Eremophila sp. Rudall River (P.G. Wilson 10512)	Scrophulariaceae	P2	Description: Shrub to 1.3 m Habitat: Rocky slopes and undulating, shaley, clay plains. Flower colour: Pink-mauve-purple Flowering period: April to September Soils: Silty loam, clay with gravel IBRA Distribution: GSD, LSD, PIL Florabase records: 14	Possible

APPENDIX B: LIKELIHOOD OF CONSERVATION SIGNIFICANT PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE WOODIE WOODIE PROJECT AREA

Note: SCC denotes State Conservation Code (refer to Appendix A for definitions). IBRA Distribution: CAR– Carnarvon; CEK – Central Kimberley; DAL – Dampierland; GAS – Gascoyne; GID – Gibson desert; GSD – Great Sandy Desert; LSD – Little Sandy Desert; MUR – Murchison; OVP – Ord Victoria Plain; PIL – Pilbara; VIB – Victoria Bonaparte. Ranking of Likelihood of occurrence in survey area is on a Unlikely-Possible-Likely scale (see Section 2.1 for ranking criteria). Information from Florabase (WAH 1998-) and Atlas of Living Australia (2019).

Species	Family	SCC	Description and Habitat	Likelihood of Occurrence
Goodenia hartiana	Goodeniaceae	P2	Description: Erect to spreading, multi-stemmed perennial herb or shrub (sub-shrub). Habitat: Sand dune swales. Flower colour: Blue/purple Flowering period: August to September Soils: Red sand IBRA Distribution: GSD, LSD, PIL Florabase records: 23	Unlikely
Aristida jerichoensis var. subspinulifera	Poaceae	P3	Description: Compactly tufted perennial grass to 0.8 m Habitat: Hardpan plains. Flower colour: n/a Flowering period: March to July Soils: Clay, loamy clay, sandy clay IBRA Distribution: GAS, MUR, PIL Florabase records: 37	Possible
Euphorbia clementii	Euphorbiaceae	P3	Description: Erect herb to 0.6 m Habitat: Gravelly hillsides and stony grounds, drainage lines. Associated with *Corymbia hamersleyana* and *Triodia* spp. hummock grassland. Flower colour: White Flowering period: May to Jul Soils: Red-brown clay-loam, sandy clay IBRA Distribution: PIL Florabase records: 28	Possible
Indigofera ammobia	Fabaceae	P3	Description: May-stemmed shrub to 0.5 m Habitat: Red sand dunes Flower colour: Green and purple Flowering period: September Soils: Red sand IBRA Distribution: CEK, DAL, GSD, OVP, PIL Florabase records: 14	Possible
Dampiera atriplicina	Goodeniaceae	P3	Description: Spreading, robust shrub to 0.5 m Habitat: Sandy ridges Flower colour: Pink Flowering period: May or July Soils: Red sand IBRA Distribution: GID, GSD, LSD, PIL Florabase records: 14	Unlikely

APPENDIX B: LIKELIHOOD OF CONSERVATION SIGNIFICANT PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE WOODIE WOODIE PROJECT AREA

Note: SCC denotes State Conservation Code (refer to Appendix A for definitions). IBRA Distribution: CAR– Carnarvon; CEK – Central Kimberley; DAL – Dampierland; GAS – Gascoyne; GID – Gibson desert; GSD – Great Sandy Desert; LSD – Little Sandy Desert; MUR – Murchison; OVP – Ord Victoria Plain; PIL – Pilbara; VIB – Victoria Bonaparte. Ranking of Likelihood of occurrence in survey area is on a Unlikely-Possible-Likely scale (see Section 2.1 for ranking criteria). Information from Florabase (WAH 1998-) and Atlas of Living Australia (2019).

Species	Family	SCC	Description and Habitat	Likelihood of Occurrence
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	Goodeniaceae	P3	Description: Open, erect annual or biennial, herb to 0.2 m Habitat: Low undulating, swampy plains. Flower colour: Yellow Flowering period: February to May, August to October Soils: Red-brown clay soil with calcrete pebbles. IBRA Distribution: GAS, PIL Florabase records: 37	Possible
Sauropus arenosus	Phyllanthaceae	P3	Description: Spreading shrub to 1m Habitat: Red sand dunes Flower colour: Yellow-green/red-pink Flowering period: May Soils: Red-brown sand. IBRA Distribution: GID, GSD, LSD Florabase records: 7	Possible
Eragrostis lanicaulis	Poaceae	P3	Description: Perennial grass or herb to 0.5 m Habitat: Red, sandy clay flats Flower colour: Green Flowering period: March to May/August to October Soils: Sand, sandy clay. IBRA Distribution: GSD, LSD, PIL Florabase records: 11	Unlikely
Nicotiana umbratica	Solanaceae	P3	Description: Erect herb to 0.7 m Habitat: Rocky outcrops Flower colour: White Flowering period: April to June Soils: Shallow soils IBRA Distribution: PIL Florabase records: 18	Possible
Rhynchosia bungarensis	Fabaceae	P4	Description: Compact, prostrate shrub to 0.5 m or climber Habitat: Amongst boulders, also on the banks of flow lines. Flower colour: Yellow Flowering period: May to September Soils: Pebbly, shingly coarse sand. IBRA Distribution: CAR, GAS, PIL Florabase records: 81	Unlikely

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Acanthaceae	*Dicladanthera forrestii*				x	x	
Aizoaceae	*Trianthema cusackianum*				x		
	Trianthema glossostigmum		x	x	x		
	Trianthema oxycalyptrum var. *oxycalyptrum*					x	
	Trianthema pilosum		x	x			
	Trianthema triquetrum			x	x	x	
	Trianthema turgidifolium			x		x	
	Trianthema sp.					x	
Amaranthaceae	*Achyranthes aspera*		x	x	x	x	x
	* *Aerva javanica*		x	x	x	x	x
	Alternanthera angustifolia		x	x			
	Alternanthera denticulata			x			
	Alternanthera nana				x	x	x
	Alternanthera nodiflora		x	x	x	x	x
	Amaranthus cuspidifolius				x	x	
	Amaranthus undulatus		x	x	x	x	x
	Gomphrena affinis subsp. *pilbarensis*		x	x	x	x	
	Gomphrena cunninghamii		x	x	x	x	
	Gomphrena sordida			x			
	Gomphrena sp.					x	
	Ptilotus aervoides		x	x	x		
	Ptilotus arthrolasius			x			
	Ptilotus astrolasius		x		x	x	
	Ptilotus auriculifolius		x	x	x	x	
	Ptilotus axillaris		x	x	x	x	
	Ptilotus calostachyus		x	x	x	x	
	Ptilotus clementii		x	x	x		
	Ptilotus drummondii			x			
	Ptilotus exaltatus		x	x	x	x	
	Ptilotus fusiformis				x	x	
	Ptilotus gaudichaudii				x		
	Ptilotus helipteroides				x		
	Ptilotus incanus				x	x	
	Ptilotus latifolius			x			
	Ptilotus obovatus		x		x	x	
	Ptilotus polystachyus		x	x	x		
	Ptilotus roei		x	x			
	Ptilotus sp.				x	x	
Apocynaceae	* *Calotropis procera*				x	x	
	Carissa lanceolata				x	x	x
	Cynanchum floribundum		x	x	x	x	
	Cynanchum viminale				x		
	Cynanchum viminale subsp. *australe*		x	x	x	x	
	Marsdenia australis				x		
Araliaceae	*Trachymene oleracea*		x	x			
	Trachymene oleracea subsp. *oleracea*		x	x	x	x	
	Trachymene sp.		x				

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Asteraceae	*Calocephalus* sp.		x				
	Calotis multicaulis		x	x			
	Calotis sp.		x				
	Centipeda minima			x	x	x	x
	Centipeda minima subsp. *macrocephala*				x		
	Centipeda minima subsp. *minima*		x	x			
	* *Flaveria trinervia*				x	x	
	Ixiochlamys cuneifolia		x	x			
	Pentalepis trichodesmoides		x				
	Pentalepis trichodesmoides subsp. *trichodesmoides*		x	x			
	Pluchea dentex		x	x	x	x	x
	Pluchea ferdinandi-muelleri				x	x	
	Pluchea rubelliflora		x	x	x		
	Pluchea tetranthera				x		
	Pluchea sp.					x	x
	Pseudognaphalium luteoalbum				x		x
	Pterocaulon serrulatum				x		
	Pterocaulon serrulatum var. *velutinum*		x	x	x		
	Pterocaulon sphacelatum		x	x	x	x	
	Pterocaulon sphaeranthoides				x		
	Pterocaulon sp.					x	
	Rhodanthe margarethae		x	x			
	* *Sonchus oleraceus*				x		x
	Streptoglossa ?decurrens				x		
	Streptoglossa odora		x	x	x		
	Streptoglossa sp.					x	x
	Asteraceae sp.				x	x	
Boraginaceae	*Ehretia saligna*		x		x		
	Ehretia saligna var. *saligna*		x	x			
	Heliotropium ammophilum		x	x			x
	Heliotropium chrysocarpum			x	x		
	Heliotropium crispatum		x	x	x	x	x
	Heliotropium cunninghamii		x	x	x	x	
	Heliotropium epacrideum			x			
	Heliotropium glabellum			x	x		
	Heliotropium glanduliferum		x	x			
	Heliotropium ovalifolium				x	x	
	Heliotropium pachyphyllum				x	x	
	Heliotropium skeleton				x		
	Heliotropium tanythrix				x		
	Heliotropium tenuifolium		x	x			
	Heliotropium transforme		x	x			
	Heliotropium sp.		x		x	x	
	Trichodesma zeylanicum		x	x	x	x	
Brassicaceae	*Lepidium amelum*	P1	x	x	x		
	Lepidium pholidogynum		x	x			
	Lepidium sp.					x	
Byblidaceae	*Byblis filifolia*			x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Campanulaceae	*Lobelia arnhemiaca*		x	x	x		x
	Wahlenbergia sp.		x	x			
Capparaceae	*Capparis spinosa*				x		x
	Capparis spinosa subsp. *nummularia*		x	x	x		
	Capparis umbonata				x		
	Capparis sp.					x	
Caryophyllaceae	*Polycarpaea corymbosa*				x	x	
	Polycarpaea corymbosa var. *corymbosa*			x			
	Polycarpaea holtzei		x	x	x	x	
	Polycarpaea longiflora		x	x	x	x	x
Celastraceae	*Stackhousia intermedia*				x		
	Stackhousia muricata				x		
	Stackhousia muricata subsp. annual (W.R. Barker 2172)			x			
	Stackhousia sp. swollen gynophore (W.R. Barker 2041)			x			
Chenopodiaceae	*Atriplex ?bunburyana*				x		
	Atriplex codonocarpa		x	x			
	Atriplex holocarpa		x	x			
	Chenopodium gaudichaudianum				x		
	Dissocarpus paradoxus			x			
	Dysphania kalpari				x		x
	Dysphania plantaginella		x	x			
	Dysphania pumilio					x	
	Dysphania rhadinostachya				x	x	
	Dysphania rhadinostachya subsp. *rhadinostachya*			x			
	Dysphania sphaerosperma		x	x			
	Dysphania sp.					x	
	Eremophea spinosa				x		
	Maireana georgei				x		
	Maireana melanocoma		x	x	x		
	Maireana tomentosa subsp. *tomentosa*				x		
	Maireana sp.				x	x	
	Rhagodia eremaea		x	x	x	x	
	Salsola australis				x		
	Sclerolaena bicornis					x	
	Sclerolaena convexula				x		
	Sclerolaena cornishiana		x	x	x	x	
	Sclerolaena costata		x	x	x	x	
	Sclerolaena densiflora		x	x	x		
	Sclerolaena deserticola				x		
	Sclerolaena eriacantha				x		
	Sclerolaena lanicuspis				x		
	Sclerolaena sp.				x	x	
	Chenopodiaceae sp.					x	
Cleomaceae	*Cleome uncifera* subsp. *uncifera*			x			
	Cleome viscosa			x	x	x	x

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Convolvulaceae	*Bonamia erecta*				x		
	Bonamia linearis				x		
	Bonamia media				x		
	Bonamia pilbarensis				x	x	x
	Bonamia sp.				x	x	
	Duperreya commixta				x	x	
	Evolvulus alsinoides				x	x	x
	Evolvulus alsinoides var. *decumbens*			x			
	Evolvulus alsinoides var. *villosicalyx*			x		x	
	Evolvulus sp.					x	
	Ipomoea coptica		x	x		x	
	Ipomoea muelleri		x	x	x	x	x
	Ipomoea sp.					x	
	Operculina aequisepala				x		
	Polymeria ambigua		x	x	x	x	
	Polymeria calycina		x		x		
	Polymeria longifolia				x	x	
	Polymeria sp.						x
Cucurbitaceae	* *Citrullus amarus*				x	x	x
	* *Citrullus colocynthis*		x	x			
	Cucumis melo				x		
	Cucumis variabilis		x		x	x	x
	Cucumis sp. Chichester Range (A.A. Mitchell et al. AAM				x		
	Cucumis sp.		x		x	x	x
Cyperaceae	*Bulbostylis barbata*		x	x	x		
	Cyperus cunninghamii subsp. *cunninghamii*				x	x	
	Cyperus difformis		x	x	x		
	Cyperus hesperius		x	x			
	Cyperus ixiocarpus					x	
	Cyperus squarrosus		x	x			
	Cyperus vaginatus		x	x	x	x	x
	Eleocharis geniculata		x	x			x
	Fimbristylis depauperata				x		
	Fimbristylis dichotoma		x	x		x	
	Fimbristylis simulans				x	x	
	Fimbristylis sp.		x	x	x		
	Schoenoplectus subulatus		x	x			
	Schoenus falcatus			x			
Elatinaceae	*Bergia henshallii*		x	x			
	Bergia perennis subsp. *obtusifolia*		x	x			
Eriocaulaceae	*Eriocaulon cinereum*			x			
Euphorbiaceae	*Adriana tomentosa*					x	
	Adriana tomentosa var. *hookeri*		x	x			
	Adriana tomentosa var. *tomentosa*		x	x			
	Euphorbia albrechtii			x			
	Euphorbia australis		x		x	x	x

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Euphorbiaceae (continued)	*Euphorbia australis* var. *australis*			x			
	Euphorbia australis var. *hispidula*			x			
	Euphorbia australis var. *subtomentosa*		x	x		x	
	Euphorbia biconvexa				x		x
	Euphorbia boophthona				x	x	
	Euphorbia careyi		x	x	x	x	x
	Euphorbia clementii	P3	x	x		x	
	Euphorbia coghlanii		x	x	x	x	x
	Euphorbia drummondii				x		x
	Euphorbia myrtoides		x	x			
	Euphorbia tannensis subsp. *eremophila*		x	x			
	Euphorbia trigonosperma		x	x			
	Euphorbia vaccaria var. *erucoides*		x	x			
	Euphorbia vaccaria var. *vaccaria*			x			
	Euphorbia sp.		x		x	x	
Fabaceae	*Acacia acradenia*		x	x	x		
	Acacia adoxa				x	x	
	Acacia adoxa var. *adoxa*		x		x	x	
	Acacia adsurgens		x	x			
	Acacia ampliceps		x	x	x	x	
	Acacia anaticeps			x			
	Acacia ancistrocarpa		x	x	x	x	
	Acacia aneura				x		
	Acacia arida		x	x	x	x	x
	Acacia balsamea		x	x			
	Acacia bivenosa		x	x	x	x	x
	Acacia bivenosa x *sclerosperma* subsp. *sclerosperma*					x	
	Acacia citrinoviridis				x	x	
	Acacia colei var. *colei*		x	x		x	x
	Acacia coriacea				x		x
	Acacia coriacea subsp. *pendens*			x	x	x	
	Acacia cuthbertsonii subsp. *cuthbertsonii*				x		
	Acacia drepanocarpa subsp. *latifolia*				x	x	
	Acacia fecunda	P1	x	x			
	Acacia glaucocaesia				x	x	
	Acacia hilliana		x	x	x	x	
	Acacia inaequilatera		x	x	x	x	
	Acacia jensenii			x			
	Acacia ligulata		x	x	x		
	Acacia maitlandii		x	x	x	x	
	Acacia monticola				x		
	Acacia orthocarpa		x				
	Acacia pachycarpa			x			
	Acacia pruinocarpa				x	x	
	Acacia ptychophylla		x	x	x		
	Acacia pyrifolia		x		x		x
	Acacia pyrifolia var. *morrisonii*		x	x			
	Acacia pyrifolia var. *pyrifolia*		x	x		x	
	Acacia retivenea subsp. *clandestina*		x	x			
	Acacia robeorum		x	x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Fabaceae (continued)	*Acacia sclerosperma* subsp. *sclerosperma*		x	x	x	x	
	Acacia setulifera	P1	x				
	Acacia stellaticeps			x			
	Acacia synchronicia		x	x	x	x	
	Acacia trachycarpa		x	x	x	x	x
	Acacia tumida			x	x	x	
	Acacia tumida var. *kulparn*			x			
	Acacia tumida var. *pilbarensis*				x	x	
	Acacia victoriae				x		
	Acacia wanyu		x	x	x		
	Acacia ampliceps				x		
	Acacia pyrifolia var. *morrisonii*				x		
	Acacia stenophylla				x		
	Acacia sp. Ripon Hills (B.R. Maslin 8460)		x	x			
	Acacia sp.		x		x	x	x
	Aenictophyton reconditum subsp. *reconditum*			x			
	Alysicarpus muelleri				x		
	Cajanus cinereus		x	x			
	Chamaecrista symonii		x	x			
	Crotalaria cunninghamii			x	x		x
	Crotalaria medicaginea			x			
	Crotalaria medicaginea var. *neglecta*		x	x	x		
	Crotalaria ramosissima		x	x			
	Crotalaria sp.					x	
	Cullen cinereum					x	x
	Cullen lachnostachys				x	x	
	Cullen leucanthum		x	x	x	x	x
	Cullen ?leucochaites					x	
	Cullen martinii				x		
	Cullen pogonocarpum				x	x	
	Cullen stipulaceum			x	x		
	Cullen sp.				x	x	
	Dichrostachys spicata		x	x			
	Erythrina vespertilio		x	x			
	Gompholobium polyzygum				x	x	
	Gompholobium simplicifolium			x			
	Indigofera ammobia	P3		x			
	Indigofera boviperda subsp. *eremaea*			x			
	Indigofera colutea		x	x	x	x	
	Indigofera linifolia		x	x	x		
	Indigofera monophylla		x	x	x	x	x
	Indigofera rugosa		x	x	x		
	Indigofera trita		x	x			
	Indigofera trita subsp. *trita*		x			x	
	Indigofera sp.				x	x	
	Isotropis atropurpurea		x	x	x	x	
	Lotus australis		x	x			
	Mirbelia viminalis				x		
	Petalostylis cassioides				x		
	Petalostylis labicheoides		x	x	x	x	x
	Psoralea sp.		x				

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Fabaceae (continued)	*Rhynchosia bungarensis*	P4		x			
	Rhynchosia minima			x	x	x	x
	Senna artemisioides subsp. *helmsii*		x	x	x	x	
	Senna artemisioides subsp. *oligophylla*		x	x	x	x	
	Senna artemisioides subsp. *x sturtii*		x				
	Senna glaucifolia				x		
	Senna ?glutinosa				x		
	Senna glutinosa subsp. *glutinosa*				x	x	
	Senna glutinosa subsp. *pruinosa*		x	x	x	x	
	Senna glutinosa subsp. *x luerssenii*		x	x	x	x	
	Senna notabilis		x	x	x	x	x
	Senna pleurocarpa var. *angustifolia*				x		
	Senna sericea				x	x	
	Senna symonii		x	x	x		
	Senna venusta		x	x	x	x	x
	Senna sp.					x	
	Sesbania cannabina		x	x	x	x	x
	Sesbania formosa		x	x			
	Swainsona decurrens		x	x	x		
	Swainsona formosa		x		x		
	Swainsona microphylla			x			
	Swainsona sp.				x		
	Templetonia hookeri		x	x	x		
	Tephrosia arenicola			x			
	Tephrosia oxalidea		x	x	x		
	Tephrosia rosea		x	x	x	x	x
	Tephrosia rosea var. *clementii*		x	x	x		
	Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)					x	
	Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)			x			
	Tephrosia sp. Dunes (J.R. Maconochie 938)		x	x			
	Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)		x	x		x	
	Tephrosia supina		x	x	x		
	Tephrosia virens				x		
	Tephrosia sp.		x		x		
	Thinicola incana			x			
	* *Vachellia farnesiana*		x	x	x	x	x
	Vigna lanceolata		x	x			x
	Vigna lanceolata var. *lanceolata*		x	x			
	Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)				x		
	Vigna sp.					x	
	Fabaceae sp.				x		x
Gentianaceae	*Schenkia clementii*						x
Goodeniaceae	*Dampiera atriplicina*	P3	x	x			
	Dampiera candicans				x	x	
	Dampiera cinerea		x	x			
	Goodenia armitiana		x	x			
	Goodenia azurea subsp. *hesperia*			x			
	Goodenia cusackiana		x	x	x		
	Goodenia hartiana	P2		x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Goodeniaceae (continued)	*Goodenia lamprosperma*		x	x			
	Goodenia microptera			x	x	x	
	Goodenia muelleriana		x	x	x	x	
	Goodenia pedicellata	P1	x	x			
	Goodenia ramelii		x				
	Goodenia ?scaevolina					x	
	Goodenia stobbsiana		x	x	x	x	
	Goodenia tenuiloba				x		
	Goodenia triodiophila			x	x	x	
	Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	P3			x		
	Goodenia sp.				x	x	
	Scaevola amblyanthera			x	x		
	Scaevola amblyanthera var. *centralis*				x	x	
	Scaevola browniana				x		
	Scaevola browniana subsp. *browniana*				x		
	Scaevola spinescens				x		
	Scaevola sp.					x	
	Goodeniaceae sp.					x	
Gyrostemonaceae	*Codonocarpus cotinifolius*				x	x	
Haloragaceae	*Haloragis gossei* var. *gossei*				x		
	Haloragis trigonocarpa		x				
	Myriophyllum verrucosum		x	x			
Hydrocharitaceae	*Najas marina*			x			
	Vallisneria nana		x	x			
Lamiaceae	*Clerodendrum floribundum* var. *angustifolium*						x
	Clerodendrum floribundum var. *ovatum*				x		
	Clerodendrum tomentosum var. *lanceolatum*		x				
	Clerodendrum tomentosum var. *tomentosum*		x	x	x		
	Clerodendrum sp.		x				
	Dicrastylis cordifolia			x	x		
	Dicrastylis doranii			x			
	Newcastelia cladotricha			x			
Lauraceae	*Cassytha capillaris*				x		
	Cassytha filiformis					x	
Loganiaceae	*Mitrasacme connata*		x	x			
Loranthaceae	*Amyema gibberula* var. *gibberula*		x	x			
	Amyema preissii		x	x			
	Amyema sanguinea		x				
	Amyema sanguinea var. *sanguinea*		x	x			
Lythraceae	*Ammannia baccifera*		x	x	x		
	Ammannia multiflora					x	x

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Malvaceae	*Abutilon amplum*				x		
	Abutilon cryptopetalum				x		
	Abutilon cunninghamii		x		x	x	
	Abutilon fraseri				x		
	Abutilon lepidum		x	x	x	x	x
	Abutilon leucopetalum			x			
	Abutilon malvifolium				x		
	Abutilon otocarpum		x	x	x		
	Abutilon oxycarpum		x		x		
	Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)		x	x	x		
	Abutilon sp. Pilbara (W.R. Barker 2025)		x				
	Abutilon sp.		x		x	x	x
	Androcalva loxophylla			x			
	Androcalva luteiflora					x	
	Corchorus crozophorifolius				x		
	Corchorus laniflorus					x	
	Corchorus lasiocarpus		x	x	x		x
	Corchorus lasiocarpus subsp. *lasiocarpus*		x	x	x		
	Corchorus parviflorus			x	x	x	x
	Corchorus sidoides subsp. *sidoides*				x	x	
	Corchorus tridens				x	x	
	Corchorus walcottii		x		x		
	Corchorus sp.		x	x	x	x	
	Gossypium australe		x	x	x	x	x
	Gossypium robinsonii		x		x	x	x
	Hibiscus brachysiphonius		x	x			
	Hibiscus coatesii		x	x	x	x	
	Hibiscus leptocladus			x			
	Hibiscus sturtii				x		
	Hibiscus sturtii var. *campylochlamys*				x	x	
	Hibiscus sp.				x	x	
	Lawrencia densiflora				x		
	* *Malvastrum americanum*		x	x	x	x	x
	Melhania oblongifolia				x	x	
	Melhania sp.		x				
	Seringia elliptica				x	x	
	Seringia nephrosperma				x		
	Sida arenicola			x	x		
	Sida arsiniata					x	
	Sida calyxhymenia				x		
	Sida cardiophylla		x	x	x	x	
	Sida clementii			x			
	Sida echinocarpa		x		x		
	Sida fibulifera				x	x	
	Sida rohlenae						x
	Sida rohlenae subsp. *rohlenae*				x	x	
	Sida sp. Articulation below (A.A. Mitchell PRP 1605)				x		
	Sida sp. Excedentifolia (J.L. Egan 1925)				x		
	Sida sp. Pilbara (A.A. Mitchell PRP 1543)				x		
	Sida sp. ?Pilbara (A.A. Mitchell PRP 1543)				x		
	Sida sp. Rabbit Flat (B.J. Carter 626)		x	x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Malvaceae (continued)	*Sida* sp. spiciform panicles (E. Leyland s.n. 14/8/90)		x	x		x	
	Sida sp. Western sand dunes (P.K. Latz 11980)			x			
	Sida sp.		x		x	x	
	Triumfetta chaetocarpa				x		
	Triumfetta clementii			x	x	x	
	Triumfetta johnstonii			x			
	Triumfetta maconochieana		x	x	x	x	
	Triumfetta propinqua		x	x	x	x	
	Triumfetta sp.		x				
	Waltheria indica				x	x	
	Waltheria virgata		x	x	x	x	
	Malvaceae sp.				x	x	x
Marsileaceae	*Marsilea drummondii*		x				
	Marsilea exarata		x	x			
	Marsilea hirsuta				x	x	x
	Marsilea mutica		x	x			
Menispermaceae	*Tinospora smilacina*		x	x	x	x	x
Molluginaceae	*Glinus lotoides*		x	x			
	Trigastrotheca molluginea		x	x	x	x	
Montiaceae	*Calandrinia ptychosperma*				x		
Moraceae	*Ficus brachypoda*		x	x	x		
	Ficus platypoda		x	x		x	x
Myrtaceae	*Calytrix carinata*				x	x	
	Corymbia aspera			x	x		
	Corymbia candida					x	
	Corymbia candida subsp. *candida*		x	x			
	Corymbia ferriticola				x		
	Corymbia hamersleyana			x	x	x	
	Corymbia opaca		x	x		x	
	Corymbia sp.					x	
	Eucalyptus camaldulensis				x	x	x
	Eucalyptus camaldulensis subsp. *obtusa*		x	x			
	Eucalyptus camaldulensis subsp. *refulgens*		x	x			
	Eucalyptus gamophylla		x	x			
	Eucalyptus kingsmillii			x			
	Eucalyptus leucophloia		x	x	x		
	Eucalyptus leucophloia subsp. *leucophloia*		x	x		x	
	Eucalyptus odontocarpa		x	x			
	Eucalyptus victrix			x	x	x	x
	Eucalyptus sp.				x	x	x
	Melaleuca argentea		x	x	x		x
	Melaleuca eleuterostachya		x	x		x	
	Melaleuca glomerata		x	x	x	x	x
	Melaleuca lasiandra			x	x	x	x
	Melaleuca leucadendra		x	x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Nyctaginaceae	*Boerhavia burbidgeana*		x	x	x		
	Boerhavia coccinea			x		x	
	Boerhavia repleta		x	x			
	Boerhavia coccinea				x		
	Boerhavia gardneri				x		
	Boerhavia sp.					x	x
Papaveraceae	* *Argemone ochroleuca*						x
	* *Argemone ochroleuca* subsp. *ochroleuca*		x	x		x	
Passifloraceae	* *Passiflora foetida*						x
	* *Passiflora foetida* var. *hispida*		x	x			
Phyllanthaceae	*Flueggea virosa* subsp. *melanthesoides*				x	x	
	Notoleptopus decaisnei				x		x
	Notoleptopus decaisnei var. *decaisnei*					x	
	Notoleptopus decaisnei var. *orbicularis*					x	
	Phyllanthus maderaspatensis			x	x	x	x
	Sauropus arenosus	P3	x				
Plantaginaceae	*Stemodia grossa*			x	x	x	x
	Stemodia viscosa		x	x			
Poaceae	*Amphipogon sericeus*		x	x	x		
	Aristida contorta			x	x	x	
	Aristida holathera var. *holathera*				x	x	
	Aristida jerichoensis var. *subspinulifera*	P3			x		
	Aristida latifolia				x		
	Aristida sp.					x	
	Bothriochloa ewartiana					x	
	* *Cenchrus ciliaris*		x	x	x	x	x
	* *Cenchrus setiger*		x	x		x	
	* *Chloris barbata*				x		
	* *Chloris virgata*				x		
	Chrysopogon fallax				x	x	
	Cymbopogon ambiguus		x	x	x	x	x
	Cymbopogon obtectus		x	x		x	
	Cymbopogon procerus				x		
	Cynodon convergens					x	
	* *Cynodon dactylon*		x	x	x		x
	Cynodon prostratus		x	x			
	Dactyloctenium radulans				x	x	
	Dichanthium fecundum		x	x	x		
	Dichanthium sericeum				x		
	Dichanthium sericeum subsp. *humilius*				x		
	Diplachne fusca subsp. *fusca*		x	x		x	
	* *Diplachne fusca* subsp. *uninervia*		x	x			
	* *Echinochloa colona*					x	
	Ectrosia danesii			x			
	Enneapogon caerulescens		x	x	x	x	
	Enneapogon lindleyanus		x	x	x	x	x

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Poaceae (continued)	*Enneapogon polyphyllus*			x	x	x	
	Enneapogon sp.					x	
	Eragrostis cumingii		x	x	x	x	
	Eragrostis desertorum				x		
	Eragrostis dielsii		x	x			
	Eragrostis eriopoda		x	x	x	x	
	Eragrostis falcata				x		
	Eragrostis lanicaulis	P3	x	x			
	Eragrostis olida			x	x		
	Eragrostis setifolia				x		
	Eragrostis speciosa		x	x			
	Eragrostis tenellula		x	x	x	x	x
	Eragrostis xerophila					x	
	Eragrostis sp.				x	x	
	Eriachne aristidea			x	x		
	Eriachne benthamii					x	
	Eriachne ciliata				x		
	Eriachne ?festucacea					x	
	Eriachne helmsii		x	x	x		
	Eriachne lanata				x	x	
	Eriachne mucronata		x	x	x	x	
	Eriachne obtusa				x		
	Eriachne pulchella				x	x	
	Eriachne pulchella subsp. *dominii*		x	x	x		
	Eriachne tenuiculmis				x		
	Eriachne sp.				x	x	x
	Eulalia aurea				x	x	
	Iseilema dolichotrichum		x	x	x		
	Iseilema eremaeum				x		
	Iseilema macratherum					x	
	Leptochloa digitata			x			
	Monachather paradoxus				x		
	Panicum effusum				x		
	Paractaenum refractum			x			
	Paraneurachne muelleri				x	x	
	Paspalidium basicladum				x		
	Paspalidium clementii		x	x	x		
	Paspalidium rarum			x	x		
	Paspalidium sp.				x		
	Perotis rara				x		
	Schizachyrium fragile				x		
	Setaria dielsii		x	x			
	Sorghum amplum			x			
	Sorghum plumosum				x		
	Sporobolus actinocladus				x	x	
	Sporobolus australasicus		x	x	x	x	x
	Sporobolus sp.					x	
	Themeda triandra		x		x	x	
	Triodia angusta				x		
	Triodia basedowii		x	x	x	x	
	Triodia brizoides		x	x	x		

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Poaceae (continued)	*Triodia epactia*				x	x	x
	Triodia longiceps				x	x	x
	Triodia pungens				x		
	Triodia schinzii		x	x			
	Triodia scintillans			x			
	Triodia wiseana		x	x	x	x	x
	Triodia sp.		x		x	x	
	Tripogonella loliiformis				x		
	Urochloa holosericea subsp. *velutina*			x			
	Whiteochloa cymbiformis			x			
	Poaceae sp.				x	x	x
Polygalaceae	*Polygala glaucifolia*			x	x		
	Polygala sp.				x		
Polygonaceae	*Persicaria* sp.		x	x			
	* *Rumex vesicarius*		x	x			
Portulacaceae	*Portulaca australis*		x	x			
	Portulaca oleracea		x	x	x	x	x
	* *Portulaca pilosa*		x	x			
	Portulaca sp.					x	
Potamogetonaceae	*Potamogeton tepperi*		x	x			
	Potamogeton tricarinatus		x	x			x
Primulaceae	*Samolus junceus*		x				
	Samolus repens		x	x			
	Samolus repens var. *floribundus*			x			
	Samolus sp. Millstream (M.I.H. Brooker 2076)		x				
Proteaceae	*Grevillea berryana*				x		
	Grevillea parallela		x				
	Grevillea pyramidalis		x	x	x	x	
	Grevillea pyramidalis subsp. *leucadendron*				x		
	Grevillea stenobotrya		x	x			
	Grevillea wickhamii				x	x	x
	Grevillea wickhamii subsp. *aprica*		x	x			
	Grevillea wickhamii subsp. *hispidula*					x	
	Grevillea wickhamii subsp. *macrodonta*		x				
	Hakea divaricata			x			
	Hakea lorea					x	x
	Hakea lorea subsp. *lorea*		x	x	x	x	
Pteridaceae	*Cheilanthes lasiophylla*		x	x			
	Cheilanthes sieberi subsp. *sieberi*				x		
	Platyzoma microphyllum		x				
Rhamnaceae	*Ventilago viminalis*					x	

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Rubiaceae	*Gardenia resinosa* subsp. *resinosa*		x				
	Oldenlandia crouchiana		x	x	x	x	
	Psydrax latifolia		x	x			
	Spermacoce occidentalis		x	x			
	Synaptantha tillaeacea var. *tillaeacea*		x	x			
Santalaceae	*Anthobolus leptomerioides*		x	x	x	x	
	Santalum acuminatum					x	
	Santalum lanceolatum				x	x	
Sapindaceae	*Atalaya hemiglauca*			x	x	x	x
	Dodonaea coriacea				x		
	Dodonaea lanceolata var. *lanceolata*				x		
	Dodonaea sp.					x	
Scrophulariaceae	*Eremophila cuneifolia*		x	x			
	Eremophila exilifolia		x	x	x		
	Eremophila ?fraseri subsp. *fraseri*					x	
	Eremophila lanceolata				x		
	Eremophila latrobei subsp. *glabra*		x	x	x		
	Eremophila latrobei subsp. *latrobei*		x	x	x	x	
	Eremophila longifolia		x	x	x		
	Eremophila sp. Rudall River (P.G. Wilson 10512)	P2	x	x			
	Eremophila tietkensii		x		x		
	Eremophila sp.		x		x		
Solanaceae	* *Datura leichhardtii*		x		x	x	x
	Duboisia hopwoodii		x	x			
	Nicotiana benthamiana		x				
	Nicotiana cavicola		x	x			
	Nicotiana occidentalis			x			
	Nicotiana occidentalis subsp. *occidentalis*		x	x	x		
	Nicotiana umbratica	P3	x				
	Solanum ashbyae				x		
	Solanum centrale		x	x			
	Solanum chippendalei		x	x	x		
	Solanum cleistogamum				x		
	Solanum diversiflorum		x	x	x	x	
	Solanum gabrielae		x	x	x	x	
	Solanum gilesii				x		
	Solanum horridum		x	x	x	x	
	Solanum lasiophyllum		x	x	x	x	x
	Solanum nigrum					x	
	Solanum phlomoides		x	x	x		
	Solanum sp.				x	x	x
Stylidiaceae	*Levenhookia chippendalei*			x			
	Stylidium fluminense		x				x
Thymelaeaceae	*Pimelea ammocharis*		x	x			

APPENDIX C: SUMMARY OF POTENTIAL AND RECORDED VASCULAR PLANT SPECIES IN THE WOODIE WOODIE PROJECT AREA (2019) AND RECORDS OF PREVIOUS MATTISKE SURVEYS (2007-2013; 2018)

Note: * denotes introduced species; P1-P4 denote priority flora species (WAH 1998-; see Appendix A for definitions).

FAMILY	SPECIES	SCC	ALA	Nature Map	Mattiske 2007/2018	2019	
						Mapping	GDE
Typhaceae	*Typha domingensis*			x	x	x	x
Violaceae	*Hybanthus aurantiacus*			x	x	x	x
Zygophyllaceae	*Roepera eichleri*		x				
	Tribulopis angustifolia				x		
	Tribulus cistoides		x		x		
	Tribulus hirsutus		x	x	x	x	
	Tribulus macrocarpus		x	x	x		
	Tribulus platypterus		x	x		x	
	Tribulus suberosus		x	x	x	x	
	Tribulus terrestris					x	
	Tribulus sp.					x	x