Biota Environmental Sciences

Marble Bar Road Upgrades SLK 97-179 Biological Survey







Prepared for Main Roads Western Australia

March 2021

© Biota Environmental Sciences Pty Ltd 2021
ABN 49 092 687 119
Level 1, 228 Carr Place
Leederville Western Australia 6007
Ph: (08) 9328 1900 Fax: (08) 9328 6138

Project No.: 1509

Prepared by: [redacted]

Document Quality Checking History
Version: Rev 0 Peer review:
Director review:
Format review:

Approved for issue:

This document has been prepared to the requirements of the client identified on the cover page and no representation is made to any third party. It may be cited for the purposes of scientific research or other fair use, but it may not be reproduced or distributed to any third party by any physical or electronic means without the express permission of the client for whom it was prepared or Biota Environmental Sciences Pty Ltd.

This report has been designed for double-sided printing. Hard copies supplied by Biota are printed on recycled paper.

This page is intentionally left blank.

Marble Bar Road Upgrades Biological Survey

Contents

1.0 Executive Summary 11

2.0 Introduction 13

2.1 Project Background 13
2.2 Spatial Scope and Report Terminology 13
2.3 Significance Framework 16
2.4 Study Objectives and Scope 16

3.0 Methodology 19

3.1 Desktop Study 19
3.2 Field Survey 23
3.3 Detailed and Targeted Flora and Vegetation Survey 25
3.4 Level 1 and Targeted Terrestrial Fauna Survey 28
3.5 Survey Limitations 37

4.0 Results 41

4.1 Desktop Study 41
4.2 Vegetation Results 56
4.3 Flora Results 86
4.4 Level 1 and Targeted Fauna Survey Results 101

5.0 Conclusions 117

5.1 Significant Communities 117
5.2 Significant Flora 117
5.3 Significant Fauna 118

6.0 References 119

Appendix 1
Framework for Significance Ranking of Species and Communities in WA

Appendix 2
EPBC Act and NatureMap Database Search Results and Maps of Significant Species Records in the Study Area

Appendix 3
Likelihood of Occurrence of Significant Flora

Appendix 4
Potential Fauna Species List

Appendix 5
Fauna Species Recorded by the Current Survey

Appendix 6
Likelihood of Occurrence of Significant Fauna

Appendix 7
Fauna Licence

Appendix 8
Vegetation Structural Classification and Condition Ranking

Appendix 9
Botanical Sampling Effort

Appendix 10
Flora Site Data and Photographs

Appendix 11
Mapping of Vegetation Types

Appendix 12
Mapping of Vegetation Condition and Introduced Flora Locations

Appendix 13
Locations of Significant Flora, and Threatened and Priority Flora Report Forms

Appendix 14
Flora Species Recorded During the Current Survey

Appendix 15
Selected Inputs and Outputs of the Floristic Analyses

Appendix 16
Fauna Sampling Effort

Appendix 17
Fauna Habitat Mapping and Locations of Significant Fauna

Appendix 18
Bilby Habitat Mapping

Tables

Table 2.1: Spatial extents and terminology used in this document. 13
Table 3.1: Polygons used for NatureMap database searches. 19
Table 3.2: Previous relevant surveys conducted within the study area. 21
Table 3.3: Likelihood ranking guide for species that may occur in the survey area. 23
Table 3.4: Survey team qualifications and experience. 24
Table 3.5: Daily meteorological observations for the survey area during the survey. 24
Table 3.6: Survey methodologies employed to target significant fauna during the field survey. 30
Table 3.7: Location and effort of 2 ha sign plots within the survey area. 31
Table 3.8: Location of targeted Bilby transect searches within survey area. 32
Table 3.9: Criteria used to assess prospective Bilby habitat. 33
Table 3.10: Location of other targeted searches within the survey and contextual areas. 34
Table 3.11: Location of nocturnal searches within the survey and contextual areas. 34
Table 3.12: Location of motion cameras deployed within the survey and contextual areas. 35

Table 3.13: Location of ultrasonic ARUs deployed within survey and contextual areas. 36
Table 3.14: Location of audible ARU deployed within the survey and contextual areas. 37
Table 3.15: Criteria used to assess fauna habitat quality. 37
Table 3.16: Potential constraints and limitations of the biological survey. 38
Table 4.1: Description of land systems within the survey area. 43
Table 4.2: Description and extent of geological units within the survey area. 45
Table 4.3: Description and extent of soil units within the survey area. 47
Table 4.4: Description and extent of Beard vegetation units within the survey area. 51
Table 4.5: Threatened flora species listed for the Pilbara bioregion. 55
Table 4.6: Overview of vertebrate fauna species with potential to occur in the survey area. 56
Table 4.7: Extent of vegetation types and other mapping units in the survey area and contextual area. 59
Table 4.8: Floristic groups at the 25% level of similarity. 81
Table 4.9: Extent of vegetation condition categories within the survey area. 81
Table 4.10: Dominant families and genera recorded from the survey area. 86
Table 4.11: Recorded species richness compared with predicted species richness using incidence-based estimators (without opportunistic records). 87
Table 4.12: Summary of weed species recorded within the survey area, including WPP rankings. 95
Table 4.13: Overview of vertebrate fauna species recorded within the survey and contextual areas during the survey. 101
Table 4.14: Pilbara Leaf-nosed Bat records from the survey. 102
Table 4.15: Western Pebble-mound Mouse mound records from the survey. 102
Table 4.16: Fauna habitats and associated attributes within the survey area and local area (comprising the survey area plus contextual area). 112
Table 4.17: Extent of prospective Bilby habitat in the local area. 116
Table 4.18: Fauna habitat utilisation by significant species. 116
Table 5.1: Significant flora recorded within the survey area, or assessed as having the potential to occur. 117
Table 5.2: Significant fauna recorded within the survey area, or assessed as "likely to occur" or "may occur". 118

Figures

Figure 2.1: Location of the Marble Bar Road Upgrades survey area. 14
Figure 2.2: Marble Bar Road Upgrades survey area, contextual area and study area. 15
Figure 3.1: Climate data recorded at the Marble Bar weather station. 25
Figure 4.1: Monthly long-term climate averages recorded at the Newman Aero weather station. 41
Figure 4.2: Land systems mapping of the study area. 44
Figure 4.3: Geological units of the study area. 46
Figure 4.4: Soil units of the study area. 48
Figure 4.5: Conservation areas within the study area. 50
Figure 4.6: Beard's vegetation mapping within the study area. 52
Figure 4.7: PECs recorded from the study area. 54

Figure 4.8 Randomised species accumulation curves for sites sampled in the survey area. 87
Figure 4.9: Species richness for the current survey area, compared to other survey areas in the locality. 88

Plates

Plate 4.1: Vegetation of hills with a boulder substrate (left), compared to a stony substrate (right). 57
Plate 4.2: Vegetation of gravelly / stony plains. 57
Plate 4.3: Vegetation of clay plains: with herbs and grasses dominating (left), and occurring in patches within an open hummock grassland (right). 57
Plate 4.4: Mulga woodland vegetation on plains (left) and knolls (right). 58
Plate 4.5: Vegetation of drainage lines: the Nullagine River (left), compared to a minor flowline (right). 58
Plate 4.6: Unit H1 (MBU21). 61
Plate 4.7: Unit H1 (MBU64). 61
Plate 4.8: Unit H2 (MBU14). 62
Plate 4.9: Unit H2 (MBU45). 62
Plate 4.10: Unit H2 (MBU57). 62
Plate 4.11: Unit H2 (MBU75). 62
Plate 4.12: Unit H3 (MBU41). 63
Plate 4.13: Unit H3 (REL10). 63
Plate 4.14: Unit H4 (MBU06). 64
Plate 4.15: Unit H4 (MBU19). 64
Plate 4.16: Unit H5, with wispy form of *Acacia orthocarpa* (MBU16). 64
Plate 4.17: Unit H5, with bushy form of *Acacia orthocarpa* (MBU26). 64
Plate 4.18: Unit H6 (MBU24). 65
Plate 4.19: Unit H6 (MBU13). 65
Plate 4.20: Unit H6 (MBU44). 65
Plate 4.21: Unit H6 (MBU72). 65
Plate 4.22: Unit H7 (MBU68). 66
Plate 4.23: Unit H7 (MBU71). 66
Plate 4.24: Unit H8 (MBU27). 67
Plate 4.25: Unit H8 (MBU79). 67
Plate 4.26: Unit P1 (MBU02). 68
Plate 4.27: Unit P1 (MBU31). 68
Plate 4.28: Unit P1 (MBU36). 68
Plate 4.29: Unit P1 (MBU78). 68
Plate 4.30: Unit P2 (MBU69). 69
Plate 4.31: Unit P2 (MBU70). 69
Plate 4.32: Unit P3 (MBU15). 69
Plate 4.33: Unit P3 (MBU66). 69
Plate 4.34: Unit P4 (MBU10). 70
Plate 4.35: Unit P4 (MBU34). 70
Plate 4.36: Unit P5 (MBU49). 71
Plate 4.37: Unit P5 (MBU50). 71
Plate 4.38: Unit C1, with open spinifex (MBU52). 72

Plate 4.39: Unit C1 (MBU46). 72
Plate 4.40: Unit C1, dominated by grasses and herbs (MBU55). 72
Plate 4.41: Unit M1 (REL20). 73
Plate 4.42: Unit M1 (REL26). 73
Plate 4.43: Unit D1 in Nullagine River (REL06). 74
Plate 4.44: Unit D1 in Cajuput Creek (REL13). 74
Plate 4.45: Unit D1 in Nullagine River (REL15). 75
Plate 4.46: Unit D1 in Wild Dog Creek (REL16). 75
Plate 4.47: Unit D2 in Taylor Creek (MBU30). 75
Plate 4.48: Unit D2 on floodplain of tributary of Christmas Creek (MBU62). 75
Plate 4.49: Unit D3 (REL08). 76
Plate 4.50: Unit D3 in Spinaway Creek (REL04). 76
Plate 4.51: Unit D4 in the Nullagine River (REL25). 77
Plate 4.52: Unit D4 (REL09). 77
Plate 4.53: Unit D5 (MBU35). 78
Plate 4.54: Unit D5 (REL07). 78
Plate 4.55: Unit D6 (RH01; from GHD 2016). 78
Plate 4.56: Unit D6 (RH04; from GHD 2016). 78
Plate 4.57: Unit D7 (RH16; from GHD 2016). 79
Plate 4.58: Unit D8 on broad island in Nullagine River. 80
Plate 4.59: Unit D8 on floodplain of Nullagine River. 80
Plate 4.60: Burnt sections of the survey area. 82
Plate 4.61: Representative photographs of the "Stony saline plains of the Mosquito land system" PEC. 84
Plate 4.62: Representative photographs of the "Four plant assemblages of the Wona land system" PEC. 85
Plate 4.63: *Acacia aphanoclada*. 89
Plate 4.64: *Acacia cyperophylla* var. *omearana* on bank of Nullagine River. 90
Plate 4.65: *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) from north of Nullagine. 91
Plate 4.66: *Nicotiana umbratica;* habitat and flowering stems. 92
Plate 4.67: *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (photos not from survey area). 92
Plate 4.68: *Rhagodia* sp. Hamersley (M. Trudgen 17794). 93
Plate 4.69: *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (photos not from survey area). 93
Plate 4.70: *Goodenia nuda* (photos not from survey area). 94
Plate 4.71: **Calotropis procera* on bank of Nullagine River. 99
Plate 4.72: **Calotropis procera* at north end of survey area. 99
Plate 4.73: **Aerva javanica* on road verge. 100
Plate 4.74: Dense tussock grassland of **Cenchrus* spp. on bank of creekline. 100
Plate 4.75: **Cenchrus* spp. tussock grassland on floodplain between branches of the Nullagine River. 100
Plate 4.76: Inactive Western Pebble-mound Mouse mound in the contextual area. 102
Plate 4.77: *Gehyra punctata* recorded during a nocturnal search in rocky habitat. 109
Plate 4.78: *Gehyra pilbara* recorded on a termite mound during nocturnal search (MBU01N). 110

Plate 4.79: Suspected *Gehyra media* recorded from stony hills during nocturnal search (MBU05N). 110
Plate 4.80: *Gehyra montium* recorded in Nullagine town. 110

1.0 Executive Summary

Main Roads Western Australia is commencing upgrade works to the Marble Bar Road between Straight Line Kilometres 97-179 (the Project), southeast of Port Hedland in the Pilbara region of Western Australia. Biota Environmental Sciences was commissioned to undertake a biological survey to identify key environmental values and their potential sensitivity to impact.

The spatial scopes for the biological survey comprised:

- the survey area (a 100 m wide corridor around Marble Bar Road, plus a 5 km extension at the southern end, and the Nullagine Bypass around the townsite);
- a contextual area (a 500 m buffer around the survey area); and
- a study area (a 40 km buffer around the survey area).

A desktop flora and fauna assessment was undertaken for the study area, to identify key biological constraints. This was followed by a detailed and targeted flora and vegetation survey in the survey area, and a Level 1 and targeted fauna field survey in the survey area and contextual area. The surveys were undertaken in March 2020 and followed high rainfall in January.

Vegetation and Flora

Approximately 19% of the survey area comprised cleared ground. A total of 23 vegetation types were identified for the remainder of the survey area, broadly grouped into hills, saline / gravelly plains, cracking clays, drainage lines and Mulga vegetation.

None of the units comprised Threatened Ecological Communities, however two vegetation types represent Priority Ecological Communities (PECs):

- Unit P1 occurred around Nullagine and was equivalent to the Priority 3 "Stony saline plains of the Mosquito land system" PEC. A total of 130.8 ha was mapped in the survey area, which represented 21.6% of the extent in the local area (defined as the survey area plus the contextual area combined).
- Unit C1 appears to correspond to the Priority 1 "Cracking clays of the Chichester and Mungaroona Range" assemblage of the "Four plant assemblages of the Wona land system" PEC. A total of 44.4 ha was mapped in the central section of the survey area, which comprised 17.3% of the mapped extent in the local area.

A total of 466 native vascular flora species from 166 genera and 55 families were recorded from the survey area, along with the alga *Chara* sp., and 25 weed species. No Threatened flora were recorded from the survey area, and none are expected to occur. Fourteen Priority flora species have been recorded from the survey area, comprising:

- four Priority 1 species *Acacia aphanoclada, A. cyperophylla* var. *omearana, Atriplex spinulosa* (historical records only) and *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795);
- three Priority 2 species: *Euphorbia inappendiculata* var. *inappendiculata, Ipomoea racemigera* and *Paspalidium retiglume*;
- six Priority 3 species: *Eragrostis crateriformis, Nicotiana umbratical, Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479), *Rhagodia* sp. Hamersley (M. Trudgen 17794), *Swainsona thompsoniana* and *Themeda* sp. Hamersley Station (M.E. Trudgen 11431); and
- one Priority 4 species: *Goodenia nuda*.

It is considered that two other Priority 3 herbs may occur in the survey area: *Iotasperma sessilifolium* and *Rostellularia adscendens* var. *latifolia*.

The most significant of the above species are the records of the Priority 1 species *Acacia aphanoclada* and *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795), both of which have relatively restricted distributions (less than 70 km at the widest point).

Fauna

Database and literature searches identified a total of 338 vertebrate fauna species with the potential to occur in the study area, of which 33 are listed as significant. Prior to the field survey, 10 taxa were assessed as "likely to occur" within the survey area, with a further seven that "may occur".

During the field survey, a combined total of 134 species of vertebrate fauna were recorded within the survey area and contextual area, including nine terrestrial mammals, 13 bats, 78 birds, 30 reptiles and four amphibians.

Two mammal taxa of significance, both of which were considered likely to occur prior to the field survey, were recorded from the survey area:

- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form; State and Federal: Vulnerable); and
- Western Pebble-mound Mouse (*Pseudomys chapmani*; State: Priority 4).

A track likely attributable to Northern Quoll (*Dasyurus hallucatus*; Endangered) was also recorded within the survey area, and a Ghost Bat (*Macroderma gigas*; Vulnerable) was observed in close proximity to the contextual area. Both of these species are considered likely to occur in the survey area, along with three Vulnerable species: Bilby (*Macrotis lagotis*), Pilbara Olive Python (*Liasis olivaceus barroni*) and Grey Falcon (*Falco hypoleucos*); the Migratory species Fork-tailed Swift (*Apus pacificus*); the Peregrine Falcon (*Falco peregrinus*), which is listed as Other Specially Protected Fauna; and the Priority 1 skink *Ctenotus nigrilineatus*.

2.0 Introduction

2.1 Project Background

Main Roads Western Australia (Main Roads) is commencing upgrade works to the Marble Bar Road (the Project), southeast of Port Hedland in the Pilbara region of Western Australia (WA; Figure 2.1). The Project, commencing in 2020, will focus on upgrading the section of Marble Bar Road from Roy Hill Mine, located at Straight Line Kilometre (SLK) 97 to SLK 179, with a 5 km extension at the southern end of the route, totalling approximately 111 km in length.

Main Roads commissioned Biota Environmental Sciences (Biota) to carry out a biological survey to identify key flora and fauna values relevant to the design and construction of the project. The survey will support the environmental impact assessment (EIA) process for the project and inform referral of the project to the WA Environmental Protection Authority (EPA) and the Commonwealth Department of Agriculture, Water and the Environment (DoAWE).

2.2 Spatial Scope and Report Terminology

The spatial scope of the required biological survey comprised the future works area for the upgrades of the Marble Bar Road. Terminology for the spatial extents referenced in this document is defined in Table 2.1 and the areas are shown in Figure 2.2.

Table 2.1: Spatial extents and terminology used in this document.

Report Terminology	Definition	Size (ha)	Flora Survey	Fauna Survey
Survey area	A 100 m wide corridor (200 m total width) comprising: • SLK 97-179; • 5 km southern extension; and • Bypass around Nullagine town.	2,319.8	Detailed flora and vegetation survey and targeted flora survey.	Level 1 and targeted fauna survey. As fauna are mobile, the fauna survey was conducted both within the survey area and in adjacent habitats in the contextual area, to inform the use or potential use of habitats in the survey area.
Contextual area	A 500 m buffer around the survey area.	13,517.1* (11,197.3 ha in addition to survey area)	No direct survey; mapping was extrapolated from survey area data and aerial imagery.	
Study area	An area of 40 km buffered around the survey area.	1,361,517.6	Desktop background information gathered from database and literature sources.	

* including survey area

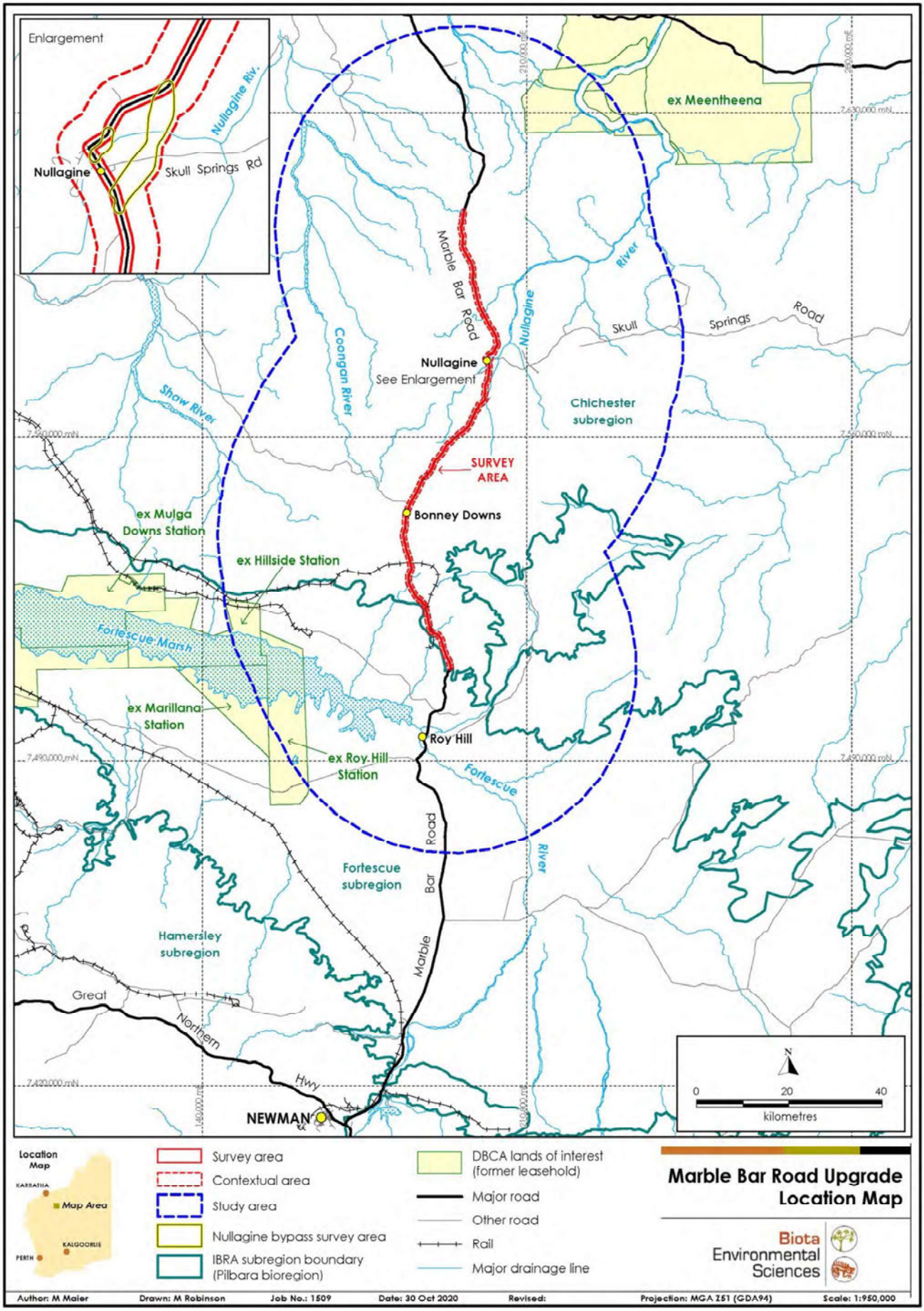


Figure 2.1: Location of the Marble Bar Road Upgrades survey area.

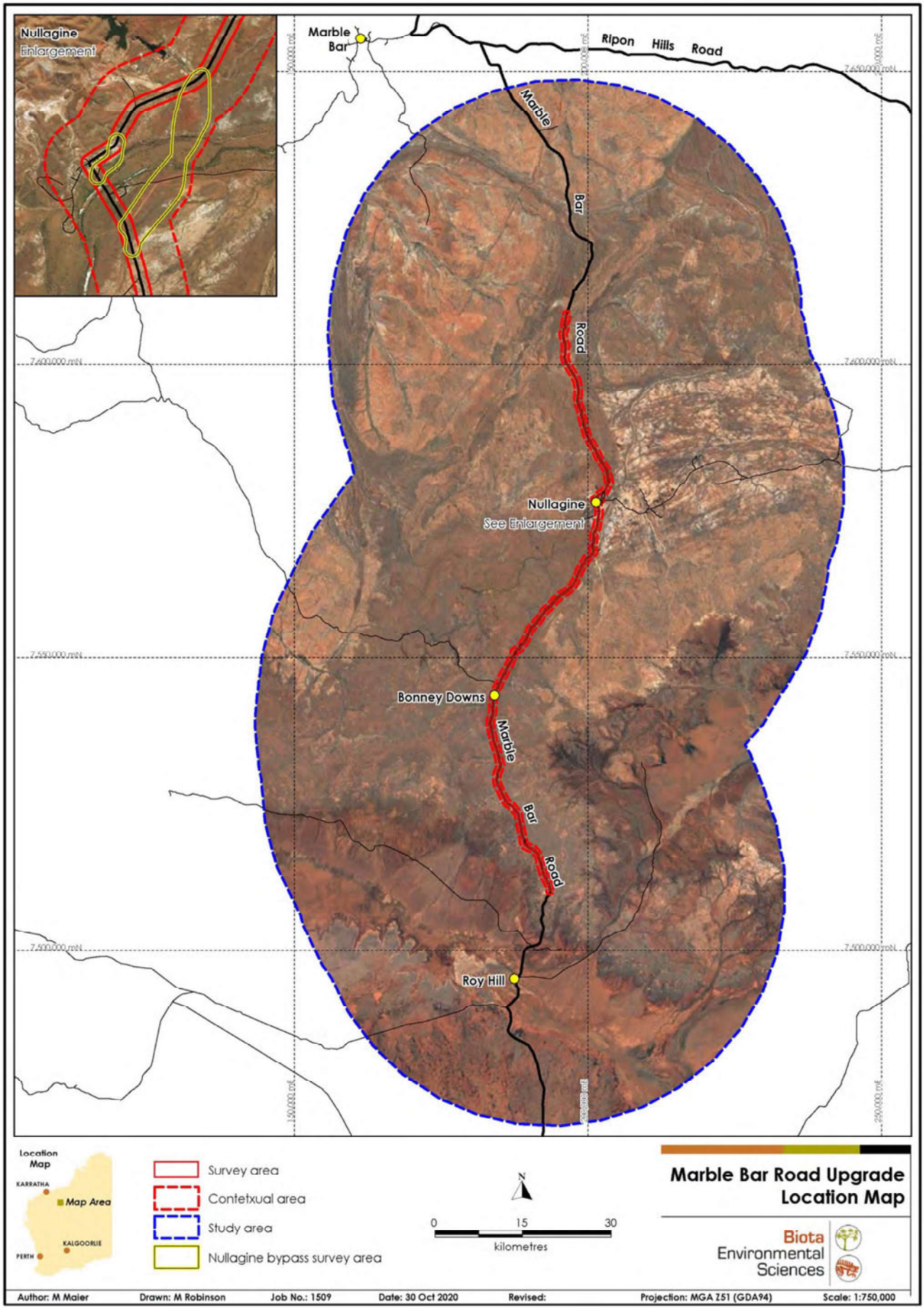


Figure 2.2: Marble Bar Road Upgrades survey area, contextual area and study area.

2.3 Significance Framework

The focus of the field surveys was to identify features of significance within the survey area, including species and ecological communities. The framework for formal listing of species in and communities of significance in WA is summarised below.

2.3.1 Communities

Threatened Ecological Communities (TECs) are described by the Department of Biodiversity Conservation and Attractions (DBCA) as biological assemblages occurring in a particular habitat, which are under threat of modification or destruction from various processes. TECs are significant at State level, being protected under the State *Biodiversity Conservation Act 2016* (BC Act), as well as having protection as Environmentally Sensitive Areas (ESAs) under the State *Environmental Protection Act 1986*. Some TECs are also protected at Commonwealth level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Further information regarding the classification of TECs is provided in Appendix 1.

Priority Ecological Communities (PECs) are ecological communities that are recognised to be of significance, but do not meet the criteria for listing as a TEC. There are five categories of PECs, none of which are currently protected under legislation (see Appendix 1).

Groundwater Dependent Ecosystems (GDEs) are also generally considered to be of significance. Some are listed as TECs or PECs, particularly organic mound springs and particular riparian systems with high water permanence.

2.3.2 Species

Native flora and fauna species that are rare, threatened with extinction, or have high conservation value, are specially protected by law as Threatened species under the BC Act and/or the EPBC Act. Migratory and Marine fauna species are also protected under the EPBC Act as Matters of National Environmental Significance (MNES). In addition, the DBCA maintains a list of species that are deemed a priority for conservation, which have not been assigned statutory protection under the BC Act but are still considered to be of conservation priority, or are considered to be rare but not threatened and are in need of monitoring. Appendix 1 details categories of significance recognised under the above frameworks.

2.4 Study Objectives and Scope

This report documents the methods, results and key findings of the biological survey of the survey area. The survey had three distinct components, with the specific scope of each described below in Sections 2.3.1 to 2.3.3.

2.4.1 Detailed and Targeted Flora and Vegetation Survey

The objectives of the flora and vegetation component of this study were to:

- undertake a desktop assessment of relevant databases and previous surveys to consolidate existing records of significant flora from the study area;
- identify significant flora species from the desktop review that are likely to occur, or may occur, within the survey area;
- conduct a single-phase Detailed survey as per EPA (2016a) and a Targeted survey for flora of significance (Threatened and Priority flora) within the survey area;
- complete sampling of flora and vegetation within the survey area to describe and characterise the vegetation, including quadrat and relevé sampling;
- compile a list of vascular flora species recorded from the survey area;

- record and photograph introduced flora species (weeds) and any other disturbances; and
- identify and map key constraints relevant to flora and vegetation in the survey area.

The methodology used for the flora and vegetation survey was consistent with the following technical documents:

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a); and
- Environmental Factor Guideline – Flora and Vegetation (EPA 2016b).

2.4.2 Level 1 Fauna Survey

The objectives of the fauna survey component of this study were to:

- undertake a desktop and literature review of relevant databases and biological surveys conducted in the study area, particularly to identify records of significant fauna;
- conduct a Level 1 reconnaissance survey of the survey area and contextual area as per current EPA guidelines (then EPA 2016c, and 2016d) [1] to search for evidence of significant vertebrate species, and to record a list of general fauna;
- determine the fauna habitats present and assess their suitability to support fauna of significance;
- create maps of fauna habitat types in the survey area and contextual area;
- create a potential list of the vertebrate fauna recorded from or potentially occurring in the survey area;
- identify and assess the likelihood of occurrence of the significant species that have the potential to occur in the survey area; and
- identify and map key constraints relevant to fauna in the survey area.

The methodology used for the fauna survey was consistent with the following technical documents:

- Technical Guidance – Terrestrial Fauna Surveys (EPA 2016c);
- Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna (EPA 2016d);
- Environmental Factor Guideline – Terrestrial Fauna (EPA 2016e);
- Survey Guidelines for Australia's Threatened Birds (DEWHA 2010a); and
- Survey Guidelines for Australia's Threatened Mammals (DSEWPaC 2011).

2.4.3 Targeted Threatened Fauna Survey

A preliminary assessment of significant fauna potentially occurring within the survey area, together with consideration of DBCA and EPA survey guidelines, indicated that particular targeting of the following species of significance was required:

- Bilby (*Macrotis lagotis*) – BC Act and EPBC Act Vulnerable: this species has been recorded previously within 10 km of the survey area; and
- Northern Quoll (*Dasyurus hallucatus*) – BC Act and EPBC Act Endangered: this species has similarly been recorded previously within 10 km of the survey area.

[1] While the Technical Guidance documents for Terrestrial Fauna Surveys (EPA 2016c) and Sampling Methods for Terrestrial Vertebrate Fauna (EPA 2016d) are now superseded by the *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020), the majority of the work undertaken for this project was completed while the previous documents were still in effect. The methodology and terminology throughout this report remain consistent with those specified in EPA (2016d).

A number of other significant species have been previously recorded within the broader study area, and therefore represent potential constraints for the project. These species are:

- Night Parrot, *Pezoporus occidentalis* (State Critically Endangered; Federal Endangered);
- Pilbara Olive Python, *Liasis olivaceus barroni* (State and Federal: Vulnerable);
- Ghost Bat, *Macroderma gigas* (State and Federal: Vulnerable);
- Pilbara Leaf-nosed Bat, *Rhinonicteris aurantia* (State and Federal: Vulnerable);
- Grey Falcon, *Falco hypoleucos* (State and Federal: Vulnerable);
- Fork-tailed Swift, *Apus pacificus* (State and Federal: Migratory);
- Peregrine Falcon, *Falco peregrinus* (State: Other Specially Protected Fauna);
- *Ctenotus nigrilineatus* (State: Priority 1);
- *Anilios ganei* (State: Priority 1);
- Western Pebble-mound Mouse, *Pseudomys chapmani* (State: Priority 4);
- Long-tailed Dunnart, *Sminthopsis longicaudatus* (State: Priority 4);
- Spectacled Hare-wallaby, *Lagorchestes conspicillatus leichardti* (State: Priority 4);
- Short-tailed Mouse, *Leggadina lakedownensis* (State: Priority 4); and
- Brush-tailed Mulgara, *Dasycercus blythi* (State: Priority 4).

Targeted searches for these species were conducted concurrently with the targeted searches for the Bilby and Northern Quoll.

Guidance for these species were consulted as follows:

- Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia (DBCA 2017a).
- EPBC Act referral guideline for the endangered Northern Quoll, *Dasyurus hallucatus* (Department of the Environment 2016).
- Survey Guidelines for Australia's Threatened Bats (DEWHA 2010b).
- Survey Guidelines for Australia's Threatened Birds (DEWHA 2010a) and Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia (DBCA 2017b).

3.0 Methodology

3.1 Desktop Study

A desktop study was undertaken to identify features of significance known from areas in close proximity to the survey area (within 20 km) or from the broader locality (i.e. within the 40 km study area). The desktop study was also used to assess the level of biological survey work that had been completed previously in the study area, which informed the design of the current survey.

The study incorporated regional information, previous biological surveys in the study area, and the results of database searches (Appendix 2). The results of the desktop study were used as the basis for compiling lists of flora species, fauna species, and ecological communities of significance potentially occurring in the survey area (see Appendices 3, 4, 5 and 6).

3.1.1 Database Searches

The following databases were searched for records of fauna, flora and vegetation of significance previously recorded from, or potentially occurring in the study area[2]:

- NatureMap database (http://NatureMap.dec.wa.gov.au): a joint project of the DBCA and the WA Museum. This database represents the most comprehensive source of information on the distribution of Western Australia's flora and fauna, comprising records from the Fauna Survey Returns database, the WA Threatened Flora and Fauna Databases, the WA Herbarium and WA Museum Specimen databases, and the BirdLife Australia Atlas. The database was searched using six polygons to account for the maximum allowable search distance in the database (see Table 3.1) to return records from both a 10 km and 20 km buffer around the survey area (Appendix 2). The 10 km and 20 km buffers were used to refine records to only those species most relevant to the survey area.
- The DBCA databases of TECs and PECs, Declared Rare and Priority Flora, and Threatened Fauna. These data searches requested the return of records from a 40 km buffer around the survey area boundary, and were provided by Main Roads.
- The Commonwealth EPBC Act Protected Matters database. The database search requested the return of records from a 20 km buffer around the survey area (Appendix 2).

Table 3.1: Polygons used for NatureMap database searches.

Polygon	NW Vertex	NE Vertex	SE Vertex	SW Vertex
10km buffer North	21°32'33"S 119°59'57"E	21°31'32"S 120° 08'10"E	21°55'25"S 120°12'55"E	21°57'26"S 120°02'19"E
10km buffer Central	21°48'30"S 120° 4'10"E	21°50'58"S 120°11'54"E	22°15'9"S 119°59'29"E	22°11'33"S 119°50'41"E
10km buffer South	22° 06'00"S 119°54'3"E	22°07'59"S 120°02'18"E	22°30'34"S 120°07'05"E	22°33'38"S 119°58'2"E
20km buffer North	21°28'00"S 119°55'22"E	21°26'55"S 120°10'47"E	21°59'34"S 120°16'54"E	22°02'31"S 119°58'54"E
20km buffer Central	21°42'44"S 120° 4'43"E	21°50'27"S 120°18'20"E	22°20'35"S 120° 00'40"E	22°14'41"S 119°45'49"E
20km buffer South	22°03'09"S 119°47'22"E	22°01'32"S 120°04'30"E	22°32'13"S 120°12'47"E	22°38'29"S 119°54'55"E

3.1.2 Literature Review

Publicly available literature (including previous surveys commissioned by Main Roads) was searched for relevant flora and vegetation surveys and fauna surveys conducted in the study area (Table 3.2).

[2] Erroneous records of species returned from the database searches (i.e. those that were outside of known ranges or would not occur in Australia) were excluded.

The reports were used to inform the likelihood assessments of communities and species of significance occurring in the survey area, and to determine potential habitats and methods for targeting these.

Table 3.2: Previous relevant surveys conducted within the study area.

Report/Document Title (Author)	Distance and Direction from Survey Area and Size of Area Surveyed (Ha)	Type of Survey/Study	Survey Dates	Taxonomic Groups Documented	Survey Methods	No. Native Species Recorded	No. Introduced Species	Survey Limitations	Features of Significance TECs and PECs / Threatened and Priority Species
BIOLOGICAL									
The Gap and Fortescue River Bridge Realignment Level 1 Vegetation, Flora and Fauna NVCP Assessment (Astron 2014)	• 15-20 km S • 1, 454 ha	Single season detailed flora and vegetation survey and Level 1 fauna survey	13/10/2014-16/10/2014	• Flora • Avifauna • Mammals • Reptiles	• Vegetation mapping • Flora quadrat assessment • Targeted searches for flora of significance • Habitat assessment • Targeted fauna searches	• 127 flora • 14 avifauna • 1 mammal • 1 reptile	• Nine introduced flora (**Aerva javanica, *Argemone ochroleuca, *Bidens bipinnata, *Cenchrus ciliaris, *C. setiger, *Citrullus colocynthis, *Cucumis myriocarpus, *Malvastrum americanum, *Vachellia farnesiana*) • One introduced mammal (European Cattle)	• Single phase survey only	• One Priority 1 flora species: *Acacia aphanoclada* • One Priority 4 flora species: *Eremophila youngii* subsp. *lepidota*
Roy Hill North Realignment, Marble Bar Road SLK 119-142 Biological Assessment (GHD 2016)	• Overlapping with survey area • 230 ha	Single season detailed flora and vegetation survey and Level 1 fauna survey	31/06/2016-02/06/2016	• Flora • Avifauna • Mammals • Reptiles • Amphibians	• Vegetation mapping • Flora quadrat assessment • Targeted searches for flora of significance • Habitat assessment • Opportunistic fauna searches • Ultrasonic call recording • Motion cameras	• 163 flora • 48 avifauna • 7 mammals • 24 reptiles • 1 amphibian	• Nine introduced flora (**Aerva javanica, *Argemone ochroleuca* subsp. *ochroleuca, *Cenchrus ciliaris, *C. setiger, *Citrullus lanatus, *Echinochloa colona, *Malvastrum americanum, *Sonchus oleraceus, *Vachellia farnesiana*) • Two introduced mammals (European Cattle, Cat) • One naturalised exotic mammal (Dog/Dingo)	• Single phase survey only • Rainfall was well below the long-term average in the four months prior to the survey • Survey area was historically disturbed through minor roads, communication corridors, rail corridor, fire and cattle grazing	• One Priority 3 flora species: *Rhagodia* sp. Hamersley (M Trudgen 17794) • One Vulnerable fauna species: Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara Form) • One Priority 4 fauna species: Western Pebble-mound Mouse (*Pseudomys chapmani*)
FLORA									
Flora and Vegetation Survey for Exploration Drilling at Noreena Downs: AR-11-08091 (Rio Tinto and Biota 2013)	• 23 – 62 km E • 305 ha	Two phase detailed flora and vegetation survey	Phase 1: Jun 2012 Phase 2: Sep 2012	• Flora	• Vegetation mapping • Flora quadrat assessment • Targeted searches for flora of significance	• 250 flora	• Nine introduced flora (**Aerva javanica, *Argemone ochroleuca* subsp. *ochroleuca, *Bidens bipinnata, *Cenchrus ciliaris, *C. setiger, *Leucaena leucocephala, *Malvastrum americanum, *Setaria verticillata, *Vachellia farnesiana*)	• Limited drill line survey	• Two Priority 3 flora species: *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) and *Rhagodia* sp. Hamersley (M. Trudgen 17794) • One Priority 4 flora species: *Acacia bromilowiana* • One Priority 4 fauna species: Western Pebble-mound Mouse (*Pseudomys chapmani*)
Flora and Vegetation of Beatons Creek (Woodgis 2019)	• Overlapping with survey area around Nullagine townsite • 356 ha	Single phase detailed flora and vegetation survey	August 2018 to April 2019	• Flora	• Vegetation mapping • Flora quadrat assessment • Targeted searches for flora of significance	• 241 flora	• One declared weed (**Calotropis procera*) • Twelve introduced flora (**Aerva javanica, *Azadirachta indica, *Cenchrus ciliaris, *Cenchrus setiger, *Citrullus amarus, *Cynodon dactylon, *Echinochloa colona, *Euphorbia hirta, *Flaveria trinervia, *Malvastrum americanum, *Phoenix dactylifera, *Vachellia farnesiana*)	• Single phase survey only	• Five Priority 1 flora species: *Acacia aphanoclada, A. cyperophylla* var. *omeareana, Atriplex spinulosa, Ptilotus wilsonii* and *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)
Bonney Downs Station Ecologically Sustainable Rangelands Management (ESRM) Plan (Biota 2015)	• Overlapping and surrounding the majority of the survey area	Desktop rangelands assessment	NA	• Desktop only	• Rangelands vegetation survey	• NA	• Five introduced flora determined to be present within the area from previous surveys: (**Cenchrus ciliaris, *Flaveria trinervia, *Parkinsonia aculeata, *Sonchus oleraceus, *Tamarix aphylla*)	• No field survey	• NA
Vegetation and Flora Survey of the Proposed FMG Stage B Rail Corridor and Mindy Mindy, Christmas Creek, Mt Lewin and Mt Nicholas Mine Areas (Biota 2004a)	• From 107 km W to 66 km E of S end of survey area • 160 km corridor	Single phase detailed flora and vegetation survey	June to Oct 2004	• Flora	• Vegetation mapping • Flora quadrat assessment • Targeted searches for flora of significance	• 599 flora	• Thirteen introduced flora (**Aerva javanica, *Argemone ochroleuca, *Bidens bipinnata, *Cenchrus ciliaris, *Cenchrus setiger, *Chloris virgata, *Citrullus colocynthis, *Echinochloa colona, *Malvastrum americanum, *Rumex vesicarius, *Setaria verticillata, *Sigesbeckia orientalis, *Sonchus oleraceus*)	• Single phase survey only	• One Priority 1 flora species: *Eremophila pilosa* • One Priority 3 flora species: *Themeda* sp. Hamersley Station (M.E. Trudge 11431) • One Priority 4 flora species: *Goodenia nuda*

Report/Document Title (Author)	Distance and Direction from Survey Area and Size of Area Surveyed (Ha)	Type of Survey/Study	Survey Dates	Taxonomic Groups Documented	Survey Methods	No. Native Species Recorded	No. Introduced Species	Survey Limitations	Features of Significance TECs and PECs / Threatened and Priority Species
FAUNA									
BC Iron Nullagine Project Extension Areas – Bonnie East, Warrigal North and Coongan: Assessment of Fauna Values (Bamford Consulting Ecologists 2013)	• 1-20 km W and N • Total area not stated	Single season reconnaissance and targeted bat surveys, and inclusion of full list of vertebrate fauna previously recorded on the tenure	22/05/2013-23/05/2013; previous surveys in 2008-2010	• Avifauna • Mammals • Reptiles • Amphibians • Fish	• Targeted searches for flora of significance • Habitat assessment • Opportunistic fauna searches • Ultrasonic call recording • Summary of previous records	• 96 avifauna • 25 mammals • 36 reptiles • 4 amphibians • 4 fish	• Two introduced mammals (European Cattle, Cat) • One naturalised exotic mammal (Dog/Dingo)	• Single phase and targeted survey only • Records from previous assessments included, but methodology of previous assessments not described	• Two Endangered species: Northern Quoll (*Dasyurus hallucatus*) and Australian Painted Snipe (*Rostratula australis*) • Three Vulnerable species: Pilbara Olive Python (*Liasis olivaceus barroni*), Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) and Grey Falcon (*Falco hypoleucos*) • One Migratory species: White-winged Black-Tern (*Chlidonias leucopterus*) • One Priority 4 species: Western Pebble-mound Mouse (*Pseudomys chapmani*)
Roy Hill Level 1 Targeted Vertebrate Fauna Assessment Updated (Biologic 2018)	• 15-70 km S • 108,257 ha	Repeat season Level 1 and targeted vertebrate fauna survey, including collation of all Roy Hill significant vertebrate fauna observations	07/08/2017 – 14/08/2017; 09/07/2018 – 15/07/2018	• Avifauna • Mammals • Reptiles	• Habitat assessment • Targeted searches • Remotely-piloted aircraft searches • Acoustic recording • Ultrasonic call recording • Motion cameras • Opportunistic sightings and secondary evidence • Roy Hill internal database search	• 2 avifauna • 8 mammals • 3 reptiles	• None	• All reported records of significant reptiles, Spectacled Hare-wallaby and Short-tailed Mouse were from site database searches, with no evidence observed in this survey	• One Endangered species: Northern Quoll (*Dasyurus hallucatus*) • Four Vulnerable species: Pilbara Olive Python (*Liasis olivaceus barroni*), Bilby (*Macrotis lagotis*), Ghost Bat (*Macroderma gigas*) and Grey Falcon (*Falco hypoleucos*) • One Specially Protected species: Peregrine Falcon (*Falcon peregrinus*) • Two Priority 1 species: *Ctenotus nigrilineatus* and *Anilios ganei* • Four Priority 4 species: Brush-tailed Mulgara (*Dasycercus blythi*), Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardti*), Short-tailed Mouse (*Leggadina lakedownensis*) and Western Pebble-mound Mouse (*Pseudomys chapmani*)
Level 1 Fauna Assessment for the Proposed Access Route for a Haul Road for Beatons Creek Mine (Terrestrial Ecosystems 2019)	• 0-2 km E • 292 ha	Single season Level 1 fauna survey	09/04/2019-10/04/2019	• None	• Habitat assessment • Opportunistic significant fauna searches	• None	• None	• No fauna observations recorded	• None
Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage B Rail Corridor and Mindy Mindy, Christmas Creek, Mt Lewin and Mt Nicholas Mine Areas (Biota 2005)	• From 107 km W to 66 km E of S end of survey area • 160 km corridor	Single season Level 1 fauna survey	20/3/2004-07/04/2004	• Avifauna • Amphibians • Mammals • Reptiles	• Habitat assessment • Targeted searches • Acoustic recording • Ultrasonic call recording • Motion cameras • Opportunistic sightings and secondary evidence	• 105 avifauna • 3 bats • 23 mammals • 42 reptiles • 2 amphibian	• Introduced mouse (Muridae), horse and donkey (Equidae), camel (Camelidae), dog (Canidae), and cat (Felidae)	• Single phase survey only • Poor access to some areas prevented survey	• One Vulnerable/Priority 4 species: Mulgara sp. (probably *Dasycercus blythi* – listed as *D. cristicauda* but subsequent revision of genus means likely attributable to *D. blythi*) • One Specially Protected species: Peregrine Falcon (*Falco peregrinus*) • Three Priority 4 species: Long-tailed Dunnart (*Sminthopsis longicaudata*), Short-tailed Mouse (*Leggadina lakedownensis*) and Western Pebble-mound Mouse (*Pseudomys chapmani*)

3.1.3 Assessment of Likelihood of Occurrence

For those significant communities and species identified in the desktop study as having been recorded from the study area, the likelihood of occurrence in the survey area was assessed prior to and following the field survey. This assessment was based on the proximity of previous records to the survey area; knowledge of the associated landforms (for communities) or habitat preferences (for species); the assessment of the habitats present within the survey and contextual areas made during the field survey; and any records obtained during the field survey.

A guide to ranking likelihood of occurrence is outlined in Table 3.3. For the purposes of this report, the term "close proximity" is defined as within 20 km of the survey area, while "locality" comprises the study area. Results of these likelihood rankings are summarised in Appendices 3 and 6 for flora and fauna respectively.

Table 3.3: Likelihood ranking guide for species that may occur in the survey area.

Rank	Criteria
Recorded	1. The species has been recorded in the survey area.
Likely to occur	1. There are existing records of the species in close proximity to the survey area/contextual area (within 20 km); and • the species is strongly linked to a specific habitat, which is present in the survey area/context area; or • the species has more general habitat preferences, and suitable habitat is present.
May occur	1. There are existing records of the species from the locality (within 40 km), however • the species is strongly linked to a specific habitat, of which only a small amount is present in the survey area/contextual area; or • the species has more general habitat preferences, but only some suitable habitat is present. 2. There is suitable habitat in the survey area/contextual area, but the species is recorded infrequently in the locality.
Unlikely to occur	1. The species is linked to a specific habitat, which is absent from the survey area/contextual area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the survey area/contextual area, however the species is very infrequently recorded in the locality or the only records are historic (>40 years ago).
Would not occur	1. The species is strongly linked to a specific habitat, which is absent from the survey area/contextual area; or 2. The species' range is very restricted and does not include the survey area/contextual area; or 3. The species is not considered extant in the locality.

3.2 Field Survey

3.2.1 Timing and Personnel

Survey team personnel and experience are included in Table 3.4.

The flora survey component of this assessment was undertaken by a team of four from 4th to 16th of March 2020; Rachel Warner and Simon Colwill participated until the 10th of March, when they were replaced by Brian Morgan and Jacinta King. A total of 46 person days were spent on this component.

The fauna survey component was undertaken by four zoologists over a 10-day period from 4th to 13th of March 2020. The survey was undertaken under a "Fauna Taking (Biological Assessment)

Licence" No. BA27000051 issued to Ms Penny Brooshooft (Appendix 7). A total of 36 person days were spent on this component.

Table 3.4: Survey team qualifications and experience.

Name	Position †	Survey Role	Qualification	Years of Experience	DBCA Licence #
Michi Maier	Principal Botanist and Director	Flora (project manager)	BSc. (Botany & Zoology) Hons	29	FB62000033
Rachel Warner	Principal Environmental Scientist	Flora (team member)	BSc. (Environmental Science) Hons	14	FB62000036
Rebecca Mason	Botanist	Flora (team member)	BSc. (Environmental Restoration & Conservation Biology)	9	FB62000035
Simon Colwill	Botanist	Flora (team member)	BSc. (Environmental Biology)	9	FB62000037
Malcolm Trudgen	Specialist Taxonomist (consultant)	Flora (team member)	BSc. (Botany)	40	FB62000245
Brian Morgan	Senior Botanist (consultant)	Flora (team member)	BSc. (Biology) Hons	19	FB62000075
Penny Brooshooft	Senior Zoologist	Fauna (project manager)	BSc. (Zoology) Hons	10	BA27000051
Dr Stewart Ford	Principal Zoologist	Fauna (team member)	BSc. (Zoology) Hons; PhD	19	BA27000051
John Graff	Zoologist	Fauna (team member)	BSc. (Conservation Biology) Hons	10	BA27000051
Jacinta King	Zoologist	Fauna/Flora (team member)	BSc. (Environmental Science) Hons	8	FB62000247

† At Biota, unless otherwise specified.

3.2.2 Daily Weather Observations

Weather observations were obtained from the Marble Bar weather station (Station 4106). Minimum and maximum temperatures remained high during the survey, creating warm conditions conducive to fauna, particularly reptile, activity. Maximum temperatures ranged from 37.9°C to 42.4°C, while minimum temperatures ranged from 22.6°C to 27.6°C (Table 3.5). No rain fell during the survey.

Table 3.5: Daily meteorological observations for the survey area during the survey.

Date	Maximum Temperature (°C)	Minimum Temperature (°C)	Rainfall (mm)	Wind at 9am (km/h)	Wind at 3pm (km/h)
04/03/20	37.9	25.5	0	22 E	6 NE
05/03/20	39.6	22.6	0	2 E	4 NNE
06/03/20	40.2	25.7	0	7 WSW	6 SW
07/03/20	41.3	26.2	0	9 SSW	9 E
08/03/20	42.3	25.9	0	17 SE	11 SE
09/03/20	42.4	25.7	0	11 SSW	11 WNW
10/03/20	41.0	24.9	0	6 SW	7 NW
11/03/20	38.1	26.2	0	4 W	13 N
12/03/20	39.5	27.6	0	0	19 N
13/03/20	39.4	26.7	0	2 WSW	9 NNW

3.2.3 Climate

Long-term climate data (2000-2020) were obtained from the Marble Bar weather station. Figure 3.1 charts the average monthly minimum and maximum temperatures and total rainfall for the year preceding the survey, in comparison with long-term averages.

The survey area received above-average rainfall during January (311 mm), two months prior to the survey, which was mostly driven by a single day of rainfall totalling 144 mm. This large rainfall event resulted in excellent growth of annual and cryptic flora species, which in general were still present during the survey, although clay areas had dried off. Temperatures leading up to the survey fluctuated around the long-term average for the area, with a slightly higher than average maximum in the year preceding (Figure 3.1).

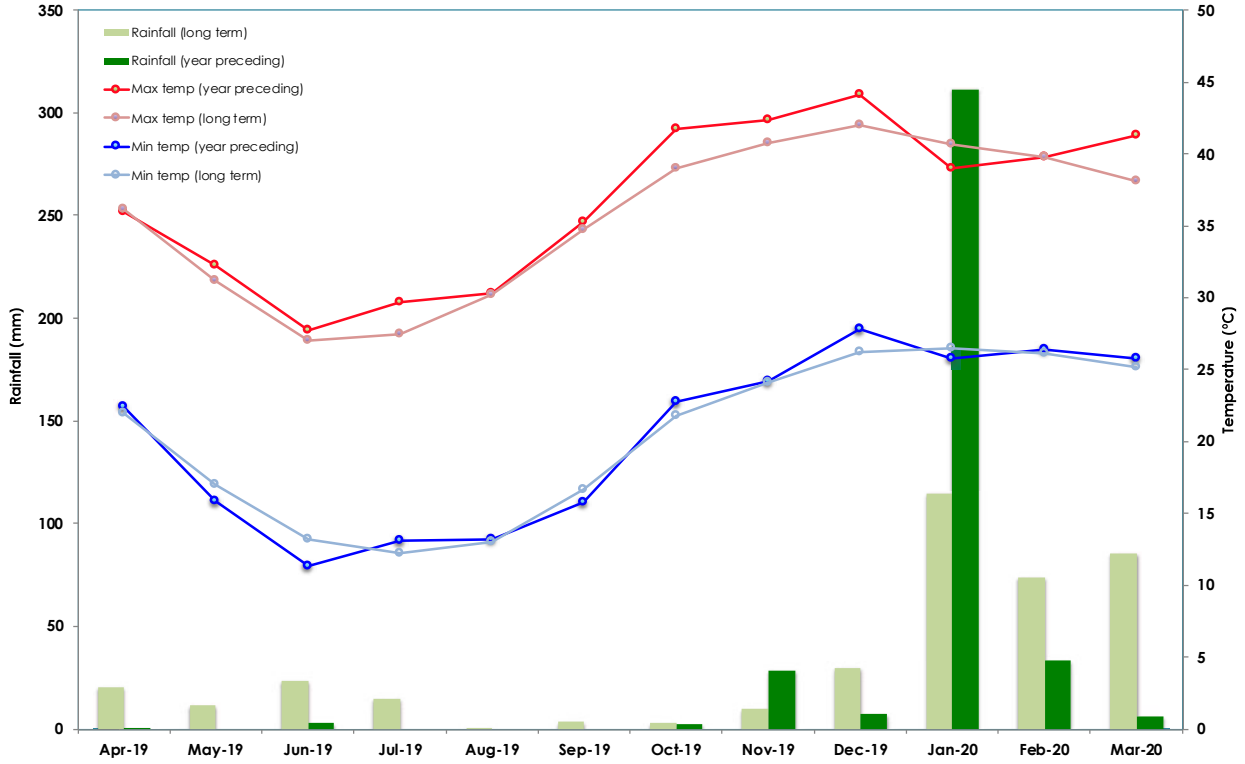


Figure 3.1: Climate data recorded at the Marble Bar weather station.
Data obtained from Bureau of Meteorology (2020).

3.3 Detailed and Targeted Flora and Vegetation Survey

3.3.1 Floristic Data Collection: Assessment of Quadrats and Relevés

Indicative sites were selected prior to the field survey, based on the broad habitats and vegetation types apparent. Once in the field, the actual locations of the sites were adjusted as necessary (e.g. to be placed in an area more representative of the broader vegetation type, to avoid recently burnt areas, etc.).

Sampling sites were established as either:

1. Quadrats: bounded floristic sampling sites. The standard for the Pilbara bioregion comprises a 50 m x 50 m square (or a modified shape with an equivalent area). Quadrats were measured out using optical squares and measuring tapes, and permanently marked with a steel fence dropper at each corner; or
2. Relevés: unbounded floristic sampling sites with a similar search area to a quadrat. Relevés were typically used where the target vegetation was too small or too narrow to effectively establish a quadrat. The relevés during the current survey were thoroughly surveyed for flora, but were not permanently marked.

The following parameters were recorded for all quadrats and relevés:

1. Location coordinates[3] (±2 m) were recorded using a hand-held Global Positioning System (GPS) unit; coordinates were recorded for all four corners of a quadrat. A central point was recorded as a minimum for the relevés, with a start and end point recorded for relevés that were undertaken in linear habitats such as long narrow creek lines;
2. Habitat: A description of the landform and habitat;
3. Soil: A broad description of the soil and any stony surface mantle or rocky outcropping;
4. Fire History: An estimate of time since last fire;
5. Disturbance Details: Vegetation condition was ranked according to the scale from EPA (2016a), which was based on that developed by Trudgen (1988); this considered evidence of grazing, physical disturbance, weed invasion etc. (see Appendix 8);
6. Vegetation Description: A broad description based on the height and estimated cover of dominant species after Aplin's (1979) modification of the vegetation classification system of Specht (1970) (see Appendix 8);
7. Flora Species: The estimated percentage foliar cover of each flora species present within the quadrat, or in the vicinity of the relevé (if not a linear site, then within a ~30 m radius of the centre point); and
8. Photograph: A representative digital photograph of the vegetation was taken, typically from the north or northwest corner of the quadrat or the central point of a relevé.

The survey area was sampled with 75 quadrats and 27 relevés. A minimum of three sampling sites was established within each vegetation type where possible, consistent with the EPA (2016a) requirements for a detailed flora and vegetation survey. Locations of the sampling sites are shown in Appendix 9, while a summary of the raw data from the sites is provided in Appendix 10.

3.3.2 Vegetation Description and Mapping

The scale of vegetation mapping is influenced by a range of factors including spatial characteristics of the survey area (e.g. the size and variety of habitats present), and other factors such as the scope of the survey and the availability of current, high-resolution aerial photography. The vegetation types for this study were described at the association level (level V as per the National Vegetation Information System; NVIS)[4]. This level of detail would be considered fine-scale (intra-locality) delineation of vegetation types as per EPA (2016a). In general, minor variations in the vegetation that were not clearly defined on aerial photography or were not practical to accurately map in the field (e.g. minor flowlines) were incorporated into the surrounding 'parent' vegetation type.

Vegetation sampling focussed on the quadrat and relevé sampling. Mapping notes were also utilised to mark the boundaries of vegetation types in the field to allow for more accurate delineation of these boundaries following the survey. Sampling was limited to the survey area only; vegetation mapping over the context area was prepared by extrapolation only.

Vegetation types and boundaries were subsequently verified using both the data collected in the field and digital imagery. Each vegetation type mapped for this assessment was given a unique alphanumeric code, comprising a character representing the broad landform group or vegetation type (i.e. 'D' for drainage lines, 'C' for cracking clay, 'M' for mulga vegetation, 'P' for plains and 'H' for hills), followed by a number sequence. The codes and a full description of each vegetation type are presented in Section 4.2.2, with the distribution of units mapped in Appendix 11.

[3] All coordinates presented in this report are in GDA94 datum and MGA50 or MGA51 projection, as denoted.

[4] http://www.environment.gov.au/land/publications/nvis-taxonomic-review/introduction#del

Vegetation condition mapping was also prepared using the categories from EPA (2016a), and is provided in Appendix 12.

Vegetation maps were created and consolidated using Geographical Information System (GIS) software (QGIS and MapInfo Professional). All maps in this report were produced by Biota's GIS team of Melissa Robinson (Senior GIS Cartographer) and Paul Sawers (GIS Manager).

3.3.3 Searches for Significant Flora and Weeds

Targeted, non-systematic searches were conducted in areas considered to be potential habitat for significant flora (i.e. Threatened or Priority listed species). The distance between botanists during traverses varied depending on the terrain, however due to the width of the survey area, a single botanist would typically traverse one side of the road to locate flora.

Locations of species of significance or unknown taxa were recorded using a hand-held GPS unit. The number of individuals and extent of the population were also recorded for each location, together with the habitat and associated species. Locations of introduced flora species (weeds) were also recorded during the foot traverses, along with an estimate of their population size. These latter searches focussed on weeds of particular management concern; i.e. Declared Pests under the WA *Biosecurity and Agriculture Management Act 2007* (the BAM Act) and Weeds of National Significance (WoNS).

Weed locations and significant flora locations are provided in Appendices 12 and 13 respectively, with the latter appendix also containing the Threatened and Priority Flora Report Forms required to be submitted to DBCA for each species.

3.3.4 Specimen Identification, Nomenclature and Data Entry

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

Voucher specimens were identified using all available flora keys, comparison with reference collections of specimens at the WA Herbarium, and in-house at Biota. Specimens were identified by Pierre-Louis de Kock (Senior Botanist / Specialist Taxonomist with Biota). Mike Hislop (Identification Botanist at the WA Herbarium) and Malcolm Trudgen (Principal of M.E. Trudgen and Associates) are also gratefully acknowledged for their assistance to further resolve some specimen identifications.

A full flora species list is provided in Appendix 14. Nomenclature and significance rankings used in this report are consistent with the current listing of WA flora recognised by the WA Herbarium on FloraBase[5] at the time of preparation of this report.

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

5 http://florabase.dpaw.wa.gov.au

3.3.5 Analysis of Flora Data

3.3.5.1 Sampling Adequacy

Plots of species accumulation curves can be used to assess sampling adequacy. When a survey has sampled an adequate proportion of the floristic assemblage, the curve should plateau and approach asymptote. EstimateS (Colwell 2013) was used to calculate smoothed species accumulation curves based on 999 random permutations of the species data; only quadrat and relevé data were used (opportunistic records were excluded).

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

3.3.5.2 Floristic Analysis

To assist with defining the vegetation types from the survey area, hierarchical clustering analyses were conducted in PRIMER v6 (Clarke and Gorley 2006) to investigate the similarity of sampling sites based on their floristic composition.

A combined species list was generated from all sites in the data set from the current survey area. Taxon names and records were then rationalised as follows:

- Species that were present at only a single site were removed to reduce 'noise' in the data set.
- Taxa that could potentially refer to more than one entity (e.g. "*Sida* sp.") were removed.
- Some taxa were merged, where considered appropriate (e.g. records of sterile material of *Evolvulus alsinoides* were merged with both identified varieties).
- All weeds were removed with the exception of **Cenchrus ciliaris* and **C. setiger,* which were dominant in the vegetation at some sites; these were merged into a single taxon, "**Cenchrus* spp."

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

Results were investigated through outputs including dendrograms (tree diagrams) of site similarity, and Non-metric Multi-Dimensional Scaling plots (NMDS plots). Selected outputs from the analyses are provided in Appendix 15.

3.4 Level 1 and Targeted Terrestrial Fauna Survey

A Level 1 reconnaissance and targeted fauna survey was undertaken in the survey area and adjacent contextual area to verify the accuracy of the desktop review, delineate and characterise the fauna assemblage. This involved describing and mapping fauna habitats and undertaking selective low-intensity sampling.

An initial assessment of the entire length of the survey area was undertaken to determine priority survey locations for each of the Threatened fauna species identified from the desktop assessment (Table 3.6), based on factors such as recent fire, location of temporary or permanent water bodies and presence of core habitat. Following this initial appraisal, targeted searches were undertaken in areas of habitat that were considered potentially suitable for significant fauna, and a more detailed habitat assessment was conducted along the length of the survey area.

Various search methods were used to target significant fauna species, including;

- targeted Bilby surveys;
- diurnal and nocturnal foot traverses searching for potential habitat, individuals and secondary evidence; and
- the deployment of passive recording equipment including ultrasonic and audible automated recording units (ARUs) and motion cameras (Table 3.6).

All fauna species encountered opportunistically within the survey and contextual areas during the field survey were also recorded.

Each search method simultaneously targeted multiple species, as outlined in Table 3.6. More detailed methodology for each search technique is outlined further in Sections 3.4.1 to 3.4.7.

Table 3.6: Survey methodologies employed to target significant fauna during the field survey.

	Significance †		Foot Traverses			Passive Recording			
Species	**State**	**Federal**	**Bilby Survey**	**Diurnal Searches**	**Nocturnal Searches**	**Motion Cameras**	**Ultrasonic ARUs**	**Audible ARUs**	**Opportunistic**
Mammals									
Northern Quoll *Dasyurus hallucatus*	EN	EN		•		•			
Bilby *Macrotis lagotis*	VU	VU	•						
Ghost Bat *Macroderma gigas*	VU	VU		•			•		
Pilbara Leaf-nosed Bat *Rhinonicteris aurantia* Pilbara form	VU	VU					•		
Brush-tailed Mulgara *Dasycercus blythi*	P4	–	•			•			
Long-tailed Dunnart *Sminthopsis longicaudatus*	P4	–				•			
Spectacled Hare-wallaby *Lagorchestes conspicillatus leichardti*	P4	–			•				
Short-tailed Mouse *Leggadina lakedownensis*	P4	–				•			
Birds									
Night Parrot *Pezoporus occidentalis*	CR	CR						•	
Grey Falcon *Falco hypoleucos*	VU	VU							•
Fork-tailed Swift *Apus pacificus*	MI	MI							•
Peregrine Falcon *Falco peregrinus*	OS	–							•
Reptiles									
Pilbara Olive Python *Liasis olivaceus barroni*	VU	VU		•	•	•			
Anilios ganei	P1	–			•				
Ctenotus nigrilineatus	P1	–	•	•					

† CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory, OS = Other Specially Protected, P1 = Priority 1, P4 = Priority 4.

3.4.1 Targeted Bilby Survey

The targeted Bilby survey was undertaken using a combination of 2 ha sign plot surveys and linear transects to search for secondary evidence of the Bilby (Sections 3.4.1.1 and 3.4.1.2). This methodology was developed in consultation with Dr Martin Dziminski (DBCA scientist with expertise in Bilby monitoring), and is consistent with DBCA guidelines for surveys to detect the presence of bilbies (DBCA 2017a). Both methods employed to search for the Bilby were also considered suitable for detecting evidence of several other significant species with similar habitat preferences (see Table 3.6).

A range of sign evidence of the Bilby was searched for during the foot traverses and sign plot searches. Sign evidence included tracks, scats, diggings or burrows, as discussed further in Section 3.4.1.3.

Bilby habitat was subsequently mapped based on the results of the targeted survey, as discussed further in Section 3.4.1.4.

3.4.1.1 2 ha Sign Plot Surveys

Sign plots aim to record sign evidence of the Bilby and other animals (tracks, scats, diggings and/or burrows). Nineteen 2 ha (200 m x 100 m) sign plots were systematically searched by a team of one or two zoologists for 20-30 minutes (a total of 30-60 person minutes for each plot) (Table 3.7). Plots were spaced at approximately 5 km intervals along the length of the survey area. Locations were selected prior to the field survey based on aerial imagery, to encompass densely vegetated areas of prospective Bilby habitat of varying fire ages (Appendix 16). In the interests of standardisation and development of best practice survey techniques for the Bilby in WA, a standardised data sheet for the 2 ha sign plot surveys (available from the DBCA) was used to record data.

Table 3.7: Location and effort of 2 ha sign plots within the survey area.

Site Name	Easting (mE)	Northing (mN)	Date	Duration (mins)	No. of Observers	Effort (mins)
MBU01BP	196268	7608357	05/03/2020	30	2	60
MBU02BP	196259	7600610	05/03/2020	30	2	60
MBU03BP	199839	7587875	06/03/2020	25	2	50
MBU04BP	202069	7583784	06/03/2020	25	2	50
MBU05BP	203093	7578781	07/03/2020	25	1	25
MBU06BP	201773	7573799	08/03/2020	30	2	60
MBU07BP	200944	7568620	08/03/2020	25	1	25
MBU08BP	196467	7561461	08/03/2020	10	2	20
MBU09BP	192989	7558262	09/03/2020	30	2	60
MBU10BP	189532	7553292	09/03/2020	28	1	28
MBU11BP	186191	7548103	09/03/2020	15	2	30
MBU12BP	183845	7542233	10/03/2020	25	2	50
MBU13BP	183478	7537641	10/03/2020	25	2	50
MBU14BP	184744	7533306	10/03/2020	25	2	50
MBU15BP	184464	7528479	10/03/2020	25	2	50
MBU16BP	187700	7523871	10/03/2020	25	2	50
MBU17BP	189025	7518365	10/03/2020	10	1	10
MBU18BP	192092	7513752	11/03/2020	25	2	50
MBU19BP	193486	7510878	11/03/2020	25	2	50
	Zone 51				**Total**	**828**

3.4.1.2 Transect Searches

Thirteen unbounded linear foot traverses were undertaken in potential habitat areas in the survey and contextual areas to search for sign evidence of the Bilby (tracks, scats, diggings and/or burrows) (Table 3.8; Appendix 16).

Table 3.8: Location of targeted Bilby transect searches within survey area.

Site Name	Date	Length (m)	Duration (mins)	No. of Observers	Effort (m)	Effort (mins)
MBU01BT	05/03/2020	2,019	64	1	3,801	128
		1,782		1		
MBU03BT	05/03/2020	466	15	2	932	30
MBU04BT	06/03/2020	1,146	31	2	2,292	62
MBU05BT	06/03/2020	586	26	2	1,172	52
MBU06BT	06/03/2020	662	34	2	1,324	68
MBU07BT	07/03/2020	1,353	45	1	2,872	90
		1,474		1		
MBU08BT	07/03/2020	413	25	2	826	50
MBU09BT	07/03/2020	1,499	33	2	2,998	66
MBU10BT	07/03/2020	879	31	1	879	31
MBU11BT	09/03/2020	912	24	1	912	24
MBU12BT	10/03/2020	385	13	1	385	13
MBU13BT	10/03/2020	456	11	2	912	22
				Total	**19,305**	**636**

3.4.1.3 Sign Evidence

Tracks

Bilby tracks show a typical quadrupedal bounding overstep gait, which produces a pattern of parallel hind foot imprints and slightly offset or in-line front foot imprints (Southgate et al. 2019). This gait pattern is consistent with other similar-sized mammals, including quolls, mulgara, bandicoots, and rabbits. However, Bilby foot imprints are distinctive when fresh, with hind foot imprints noticeably longer than front foot imprints and bearing few conspicuous indentations, while front foot imprints have three distinct parallel lines produced by the toes and claws (Moseby et al. 2012, Southgate et al. 2019).

Scats

Bilbies produce distinctive scats that are oblong in shape, longer than they are wide, firm, usually contain a mixture of sand, plant and invertebrate material, have a smooth coating and rounded ends, and are typically deposited in a group of two to five pellets (Southgate et al. 2019). These are most commonly found in association with digging activity, deposited on top of or within spoil piles of diggings, and sometimes at burrow entrances (Southgate et al. 2019).

Diggings

Bilbies forage for food at the soil surface, or dig in the subsoil for beetles, termites, root-dwelling larvae, seeds and bulbs (Southgate et al. 2019). Where the Bilby has foraged, diggings are generally conspicuous and distinctive, especially where they occur at the base of shrubs or forbs known to contain root-dwelling larvae, as the Bilby is the only species in mainland Australia that is known to for root-dwelling larvae in this manner (Southgate et al. 2019). Diggings of the Bilby can be of different size and shape, but are typically:

- shallow (5-10 cm in depth), with the spoil pile evenly distributed around the dig;
- deep conical or cylindrical digs, usually less than 50 cm deep; or
- large ploughed areas of multiple shallow diggings around termite nests.

In the Pilbara, typical food source plants include *Acacia bivenosa*, *A. colei*, *A. stellaticeps*, *A. trachycarpa*, *A. dictyophleba, A. melleodora, Yakirra australiensis* and *Senna notabilis*.

Burrows

Bilby burrows typically have a single round entrance, usually with an apron of excavated sand at the entrance, and are often found under logs, at the base of trees, spinifex tussocks, termite mounds or sand mounds (Moseby et al. 2012, Southgate et al. 2019). It is common to observe multiple burrows within an established foraging area, and 'warrens' with multiple burrow entrances can sometimes occur (Southgate et al. 2019). Bilby burrows are distinguishable from the burrows of varanids and other reptiles, which typically have a crescent-shaped entrance (Southgate et al. 2019).

3.4.1.4 Bilby Habitat Mapping

At a landscape scale, a multitude of factors affect suitability of habitat for the Bilby, and thus its occurrence, including landform, substrate, vegetation, fire frequency, rainfall, land clearance and presence of introduced herbivores and carnivores (Cramer et al. 2016). Within WA, three landforms have been identified as primary Bilby habitat, described broadly as (1) residual landforms, (2) fluvial landforms, and (3) plains and dune fields (Cramer et al. 2016). Additionally, soil, sand, sandy clay or sandy gravel substrates have been identified as critical to the presence of the Bilby, as they enable burrow construction (DBCA 2017c).

Acknowledging the complexity of the factors that define Bilby habitat, a finer scale, survey-specific approach has been developed here to map Bilby habitat within the survey area. The approach recognises that Bilby presence is strongly linked to the availability of food resources, which are intrinsically dependent on fire history (Southgate 2005). Bilbies have been recorded in habitats with a range of fire-ages, including recently burnt (1-2 years), unburnt (3-6 years) and long unburnt (>6 years) areas (Southgate 2005, Southgate and Carthew 2007, DBCA 2017a). This has been attributed to fire influencing food availability: fire (and subsequent rainfall) promotes regeneration of some short-lived species such as the grass *Yakirra australiensis*, the seeds of which form dominant components of the Bilby diet when available (Southgate 2005, Liddle 2016). Fire also promotes the growth of other short-lived species such as *Senna notabilis,* the roots of which host larvae, another key component in the Bilby diet (Liddle 2016, DBCA 2018a). Conversely, fire kills larvae host species that are long-lived and obligate seeders, as many *Acacia* species are (Liddle 2016). These long-lived species only develop hosting capacity for larvae after the plant reaches a certain age (Liddle 2016), suggesting that unburnt stands of these species are important for the Bilby from the dietary perspective.

Considering the above, a set of criteria was developed to determine the prospectivity of habitat within the survey area (Table 3.9). Habitats were described and mapped based on a joint appraisal of mapped vegetation units from the current survey and fire history mapping from the North Australia and Rangelands Fire Information website (http://www.firenorth.org.au/nafi3/). It should be noted that the mapping produced is representative of the habitat at the time of writing: many biotic and abiotic factors determine suitability of Bilby habitat, and temporal changes in these factors influence Bilby presence. The habitat map should therefore be viewed as a guide to delineate areas that may currently be of importance to the Bilby, in the absence of significant change in influencing factors (e.g. post-survey fires and rainfall, or increase in prevalence of introduced predators).

Table 3.9: Criteria used to assess prospective Bilby habitat.

Habitat Prospectivity	Criteria
High	1. Habitat supporting long-lived shrubs or forbs known to contain root-dwelling larvae and other important food source plants (e.g. *Acacia bivenosa*, *A. colei*, *A. stellaticeps*, *A. trachycarpa*, *A. dictyophleba, A. melleodora* and *Senna notabilis*) in unburnt and long unburnt areas on sandy to sandy-gravel substrates, and/or 2. Habitat supporting short-lived shrubs or forbs known to contain root-dwelling larvae and other important food source plants (e.g. *Senna notabilis* and *Yakirra australiensis*) in recently burnt areas on sandy to sandy-gravel substrates.
Moderate	1. Habitat broadly typical of suitable Bilby habitat in the Pilbara (e.g. *Triodia* grasslands, sparsely vegetated drainage lines, substrate sandy to rocky-sandy), but with no mapped records of important food source plant species.
Low	1. Habitat does not meet any of the criteria listed above.

3.4.2 Diurnal Searches

Additional targeted foot traverses were undertaken to search for individuals, secondary evidence and potential habitat for multiple significant taxa (Table 3.10). These searches were undertaken at 16 locations within the survey and contextual areas, totalling over 53 km and 36 hours of search effort (Table 3.10; Appendix 16).

Table 3.10: Location of other targeted searches within the survey and contextual areas.

Site Name	Date	Targeted Species	Length (m)	Duration (mins)	No. of Observers	Effort (m)	Effort (mins)
MBU01TS	05/03/2020	Northern Quoll, Pilbara Olive Python	1,337	32	1	2,003	64
			666		1		
MBU02TS	05/03/2020	Northern Quoll, Pilbara Olive Python	1,282	78	2	2,564	156
MBU03TS	06/03/2020	Northern Quoll, Pilbara Olive Python	1,324	60	4	5,296	240
MBU04TS	06/03/2020	Ghost Bat, Northern Quoll	4,444	149	2	8,888	298
MBU05TS	07/03/2020	Northern Quoll, Pilbara Olive Python	380	35	2	760	70
MBU06TS	07/03/2020	*Ctenotus nigrilineatus*	393	49	2	786	98
MBU07TS	07/03/2020	*Ctenotus nigrilineatus*	885	40	1	1,992	80
			1,107		1		
MBU08TS	08/03/2020	Northern Quoll, Pilbara Olive Python	1,645	119	1	3,017	238
			1,372		1		
MBU09TS	09/03/2020	Northern Quoll, Pilbara Olive Python	1,193	67	2	2,386	134
MBU10TS	08/03/2020	Northern Quoll, Pilbara Olive Python	756	18	1	756	18
MBU11TS	10/03/2020	Northern Quoll, Ghost Bat	3,012	102	1	6,507	204
			3,495		1		
MBU12TS	10/03/2020	Northern Quoll	2,460	75	2	4,920	150
MBU13TS	11/03/2020	Night Parrot habitat	1,543	31	2	3,086	62
MBU14TS	10/03/2020	Northern Quoll, Ghost Bat	1,169	37	2	2,338	74
MBU15TS	12/03/2020	Northern Quoll, Ghost Bat	2,917	81	2	5,834	162
MBU16TS	12/03/2020	Northern Quoll, Pilbara Olive Python	953	66	2	1,906	132
					Total	**53,039**	**2,180**

3.4.3 Nocturnal Searches

The warm conditions experienced during the survey, which followed recent rainfall, were conducive to relatively high levels of nocturnal reptile activity. As such, extensive nocturnal search effort was undertaken to target reptiles, particularly Pilbara Olive Python (*Liasis olivaceus barroni*) and the blind snake *Anilios ganei*. Nocturnal mammals of significance were also targeted, including the Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardti*). Nocturnal searches were undertaken on six nights, for a total of nearly 57 hours of survey effort (Table 3.11; Appendix 16).

Table 3.11: Location of nocturnal searches within the survey and contextual areas.

Site Name	Easting (mE)	Northing (mN)	Date	Duration (mins)	No. of Observers	Effort (mins)
MBU01N	202233	7577878	05/03/2020	184	4	736
MBU02N	203326	7581444	06/03/2020	111	4	444
MBU03N	201424	7576541	07/03/2020	136	4	544
MBU04N	201323	7571796	08/03/2020	52	4	208
MBU05N	197371	7562149	09/03/2020	211	4	844
MBU06N	190131	7554745	10/03/2020	157	4	628
	Zone 51				**Total**	**3,404**

3.4.4 Motion Cameras

Infrared motion cameras (Reconyx Hyperfire and Bushnell Trophy Cam) were deployed at 34 locations within the survey area and contextual area for two to three nights at each location, for a total of 72 nights of effort (Table 3.12; Appendix 16). Cameras were baited with a universal bait (peanut butter and oat mix).

Table 3.12: Location of motion cameras deployed within the survey and contextual areas.

Site Name	Easting (mE)	Northing (mN)	Landform	Deployment Date	Retrieval Date	Effort (nights)
MBU01M	196210	7607129	Major drainage line	05/03/2020	07/03/2020	2
MBU02M	196244	7607131	Major drainage line	05/03/2020	07/03/2020	2
MBU03M	196274	7607097	Major drainage line with water	05/03/2020	07/03/2020	2
MBU04M	195700	7601156	Rocky gully	05/03/2020	07/03/2020	2
MBU05M	195675	7601180	Rocky gully	05/03/2020	07/03/2020	2
MBU06M	198545	7592626	Boulder outcrop	05/03/2020	07/03/2020	2
MBU07M	198542	7592564	Boulder outcrop	05/03/2020	07/03/2020	2
MBU08M	198592	7592539	Boulder outcrop	05/03/2020	07/03/2020	2
MBU09M	201613	7584410	Minor flowline in *Acacia* plain	07/03/2020	09/03/2020	2
MBU10M	201596	7584454	Minor flowline in *Acacia* plain	07/03/2020	09/03/2020	2
MBU11M	201564	7584512	Minor drainage line in *Acacia* plain	07/03/2020	09/03/2020	2
MBU12M	203165	7581573	Rocky gully	07/03/2020	09/03/2020	2
MBU13M	203129	7581602	Rocky gully	07/03/2020	09/03/2020	2
MBU14M	203027	7581658	Rocky gully	07/03/2020	09/03/2020	2
MBU15M	201441	7570462	Rocky gully	08/03/2020	11/03/2020	3
MBU16M	201446	7570458	Rocky gully	08/03/2020	11/03/2020	3
MBU17M	201533	7570437	Rocky gully near drainage line	08/03/2020	11/03/2020	3
MBU18M	201503	7570430	Rocky gully near drainage line	08/03/2020	11/03/2020	3
MBU19M	199487	7565831	Permanent waterhole	09/03/2020	11/03/2020	2
MBU20M	199458	7565806	Permanent waterhole	09/03/2020	11/03/2020	2
MBU21M	192333	7556297	Rocky gully	09/03/2020	11/03/2020	2
MBU22M	192368	7556333	Permanent waterhole	09/03/2020	11/03/2020	2
MBU23M	192958	7558196	Cracking clay plain	09/03/2020	11/03/2020	2
MBU24M	193020	7558209	Cracking clay plain	09/03/2020	11/03/2020	2
MBU25M	187815	7523194	Mesa breakaway	11/03/2020	13/03/2020	2
MBU26M	187769	7523082	Mesa breakaway	11/03/2020	13/03/2020	2
MBU27M	187749	7523031	Mesa breakaway	11/03/2020	13/03/2020	2
MBU28M	187746	7522873	Mesa breakaway	11/03/2020	13/03/2020	2
MBU29M	187796	7522786	Mesa breakaway	11/03/2020	13/03/2020	2
MBU30M	187857	7522703	Mesa breakaway	11/03/2020	13/03/2020	2
MBU31M	188297	7520719	Rocky slope near major drainage line	11/03/2020	13/03/2020	2
MBU32M	188267	7520727	Rocky slope near major drainage line	11/03/2020	13/03/2020	2
MBU33M	188248	7520721	Rocky slope near major drainage line	11/03/2020	13/03/2020	2
MBU34M	188198	7520726	Rocky slope near major drainage line	11/03/2020	13/03/2020	2
	Zone 51				**Total**	**72**

3.4.5 Ultrasonic ARUs

SongMeter4BAT (SM4BAT) ultrasonic ARUs were used within the survey area and contextual area to detect bat species, including the Ghost Bat (*Macroderma gigas*) and Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form). The units were programmed following the manufacturer's recommendations for selectable filters and triggers, jumper and audio settings for bat detection (Wildlife Acoustics 2010). Bat sampling was undertaken at 12 sites for a period of two to three nights at each site (Table 3.13; Appendix 16).

Bat echolocation call analysis was conducted by Dan Kamien of Biota using Kaleidoscope Pro software (version 4.3.2), and following methods recommended by the Australasian Bat Society (2006) in conjunction with available reference data (Churchill 2008, McKenzie and Bullen 2009). Only sequences containing good quality search phase calls were considered for identification.

Table 3.13: Location of ultrasonic ARUs deployed within survey and contextual areas.

Site Name	Easting (mE)	Northing (mN)	Landform	Deployment Date	Retrieval Date	Effort (nights)
MBU01BAT	196115	7606613	Major drainage line	05/03/2020	07/03/2020	2
MBU02BAT	202163	7578309	Wetland (Nullagine Reservoir overflow)	06/03/2020	08/03/2020	2
MBU03BAT	200905	7585992	Major drainage line	06/03/2020	09/03/2020	3
MBU04BAT	201434	7576623	Major drainage line	07/03/2020	09/03/2020	2
MBU05BAT	203171	7581574	Rocky gully	07/03/2020	09/03/2020	2
MBU06BAT	201317	7571733	Boulder hills and outcrops	08/03/2020	11/03/2020	3
MBU07BAT	201438	7570467	Rocky gully	09/03/2020	11/03/2020	2
MBU08BAT	199530	7565833	Permanent waterhole	09/03/2020	11/03/2020	2
MBU09BAT	188432	7520744	Major drainage line	10/03/2020	13/03/2020	3
MBU10BAT	183963	7536156	Rocky breakaway	11/03/2020	13/03/2020	2
MBU11BAT	187771	7523083	Mesa breakaway	11/03/2020	13/03/2020	2
MBU12BAT	190003	7554860	Major drainage line	11/03/2020	13/03/2020	2
	Zone 51				**Total**	**27**

3.4.6 Audible ARU

A SongMeter4 (SM4) audible ARU was set to record in the audible range and deployed at four locations within the survey area and contextual area, targeting Night Parrots (Table 3.14; Appendix 16). The unit was programmed to record continuously each night from one hour prior to sunset until one hour after sunrise. Methodology was in accordance with the interim guidelines for Night Parrot surveys (DBCA 2017b), with the exception that units were only deployed for one or two nights rather than six nights. Recent research has demonstrated that Night Parrots call from roost sites reliably every night shortly after sunset, with the exception of during adverse weather conditions (e.g. heavy rainfall, high winds), which may affect calling and/or detectability (N. Jackett, Broome Bird Observatory, pers. comm. 2020). As weather conditions during the survey were excellent for calling and detectability (see Section 3.2.2), ARUs were deployed for shorter periods to allow for coverage of more sites.

Audio files were analysed by John Graff of Biota using SongScope software (version 4.1.5), with a recognizer built using Night Parrot calls recorded in Western Australia[6]. Potential matches were then assessed manually by visually inspecting the spectrogram and listening to the recordings.

6 Night Parrot calls are available at https://nightparrot.com.au/index.php/resources/night-parrot-calls

Table 3.14: Location of audible ARU deployed within the survey and contextual areas.

Site Name	Easting (mE)	Northing (mN)	Landform	Deployment Date	Retrieval Date	Effort (nights)
MBU01A	202246	7578411	Wetland (Nullagine Reservoir overflow)	06/03/2020	08/03/2020	2
MBU02A	184134	7536002	Spinifex plain near man-made dam holding water	12/03/2020	13/03/2020	1
MBU03A	201829	7575861	Gravelly spinifex plain with ponded water	08/03/2020	10/03/2020	2
MBU04A	191948	7556653	Spinifex near major drainage line	10/03/2020	12/03/2020	2
	Zone 51				**Total**	**7**

3.4.7 Fauna Habitat Mapping

Fauna habitat mapping was undertaken using a functional, ecological perspective on fauna use of the landscape (Biota 2013). Vegetation mapping conducted for the survey was also used for fauna habitat descriptions.

Broad fauna habitat areas were mapped in the field using a combination of foot traverses, vehicle traverse of the existing road, and unmanned aerial vehicle (UAV/drone) photography. Habitats were described and mapped based on areas within the survey area and contextual area that would be likely to offer a range of ecological niches for a suite of different species, with consideration of landform, substrate and vegetation. It is important to note that each broad habitat area defined here cannot be used to map the distribution of any one species or group of taxa, as many species utilise a range of ecological niches for specific activities such as foraging, commuting, breeding and nesting. The resultant habitat map may therefore be viewed as a guide to delineate areas that may be of differing ecological importance to the fauna species utilising the survey and contextual areas.

Quality of fauna habitat was also considered according to the criteria defined in Table 3.15.

Table 3.15: Criteria used to assess fauna habitat quality.

Habitat Quality	Criteria
Excellent	Minimal to no modification of habitat from intense/frequent fires, trampling/grazing by introduced herbivores or weed invasion.
Good	Some habitat modification from intense/frequent fires, trampling/grazing by introduced herbivore and/or weed invasion.
Poor	Habitat mostly or completely modified by intense/frequent fires, trampling by introduced herbivores, invasion of weeds and/or clearing.

3.4.8 Fauna Nomenclature

As per the relevant Technical Guidance (EPA 2016d), species nomenclature for mammals, reptiles and amphibians follows that of the WAM fauna taxonomic checklist, which was last revised in April 2020. Species nomenclature for avifauna follows that of Christidis and Boles (2008).

3.5 Survey Limitations

In accordance with the EPA Technical Guidances for 'Flora and Vegetation Surveys for Environmental Impact Assessment' (EPA 2016a) and 'Sampling Methods for Terrestrial Vertebrate Fauna' (EPA 2016d), potential constraints and limitations of this biological survey of the survey and contextual areas are addressed in Table 3.16.

Table 3.16: Potential constraints and limitations of the biological survey.

Potential Constraint	Statement of Limitations
1. Availability of contextual information at a regional and local scale	• Extensive previous survey work has been undertaken in the region, however few studies have been completed in close proximity. Contextual information was readily available at the locality scale, with the exception of equivalently sampled floristic quadrats. • Contextual information was not considered a substantial limitation for the study.
2. Competency/ experience of the team carrying out the survey, including experience in the bioregion surveyed	• All field personnel were suitably qualified and have extensive experience in the Pilbara region. • Competency was not considered to be a limitation.
3. Proportion of species recorded and/or collected, any identification issues	• All vascular flora encountered in the survey area were recorded, with collections made of any taxa that were unusual, or difficult to identify without microscopic examination. The majority (94%) of flora taxa were able to be identified to the lowest level possible within the current taxonomic framework. • The Level 1 reconnaissance and targeted fauna survey recorded species via targeted and opportunistic methods, and verified habitats with the potential to support significant species; the targeted surveys focused on recording evidence of significant species. An inventory survey of all fauna species was not completed, as this would require systematic trapping as part of a larger Level 2 survey, which was not required to meet the objectives of the current survey. • The recent taxonomic revision of the genus *Gehyra* in the Pilbara (Doughty et al. 2018, Kealley et al. 2018) meant some *Gehyra* individuals recorded were difficult to identify with certainty. • Overall, identification and proportion of species recorded was not considered to be a limitation given the objectives of the surveys.
4. Appropriate area fully surveyed (effort and extent)	• Flora site sampling was completed through all representative habitats in the survey area. Including historical sampling by GHD (2016) as well as the current survey, at least three replicate sites have been sampled in each vegetation type except for: o the drainage line units D5 and D7 – only two sites were sampled in each unit, both of which had a limited representation in the survey area (9.5 ha and 3.6 ha respectively); and o D8 – no sites were sampled as the vegetation was in Very Poor condition, being extensively invaded by weeds and heavily grazed. • Targeted searches for significant flora were completed within representative areas of all available habitats, however the entire survey area was not systematically searched. For most of the Priority species, the survey data provide a relatively good indication of the likely extent of suitable habitat; the exception was the Priority 1 *Atriplex spinulosa*, which was only recorded historically. Additional sampling would be required to fully document the extent of all significant flora species in the survey area. • The survey comprised a single phase of sampling, and additional sampling would undoubtedly lead to additional taxa being recorded. • The fauna survey targeted specific fauna species of significance. The survey area was surveyed thoroughly from a fauna perspective, with numerous sampling sites assessed and foot traverses completed by the fauna team, including some in the contextual area. • The study comprehensively assessed the occurrence of habitat for significant fauna species within the survey and contextual areas. Survey effort targeted at detecting the presence of the Bilby was in accordance with that recommended by DBCA (2017a). • Fauna survey effort and extent were not considered to be limitations for the current study.

Potential Constraint	Statement of Limitations
5. Access restrictions within the survey and contextual areas	• The survey area and contextual area were readily accessible, being located adjacent to the existing Marble Bar Road. • The only access restrictions were areas in close proximity to the Roy Hill rail line (within 15 m), which intersects part of the southern section of the survey area, in which no survey activities were permitted; and known heritage sites near Nullagine, in which site were not able to be permanently established. These restrictions overall represented a very small proportion of the survey area (approximately 4.5 ha and 35 ha respectively, or 1.7% of the survey area). • Access was not considered to be a limitation.
6. Survey timing, rainfall, season of survey	• The survey was undertaken during March 2020, and the area had received high rainfall in January. This was suitable timing for detecting terrestrial fauna groups in the Pilbara. The timing was also generally favourable for flora collection, however the cracking clay substrates were already relatively dry; most annual species (and some perennial herbs) were dead or drying off, although in general there was sufficient material left to confirm species identifications. • Survey timing was not considered to be a limitation.
7. Disturbance that may have affected the results of survey such as fire, flood or clearing	• Some areas of the survey area and contextual areas had recently been burnt, particularly in the southern parts. The mulga woodland habitat type was almost completely burnt. All other habitat types present within the burnt areas were present in unburnt condition elsewhere within the survey area and contextual area. • Extensive clearing has been undertaken around the town of Nullagine, and the existing Marble Bar road runs through the length of the survey area. However, sufficient uncleared areas exist for all habitat types to allow sampling in relatively undisturbed areas. • Disturbance is not considered to have been a limitation for the study.

This page is intentionally left blank.

4.0 Results

4.1 Desktop Study

4.1.1 IBRA Bioregion and Subregion

The Interim Biogeographic Regionalisation for Australia (IBRA) recognises 89 bioregions and 419 subregions within Australia (DSEWPaC 2012). The survey area lies within the Pilbara bioregion, and more specifically within the Chichester subregion, which covers 9,044,560 ha and is described by Kendrick and McKenzie (2003) as follows:

> *"The Chichester subregion (PIL 1) comprises the northern section of the Pilbara Craton. Undulating Archaean granite and basalt plains include significant areas of basaltic ranges. Plains support a shrub steppe characterised by Acacia inaequilatera over Triodia wiseana (formerly Triodia pungens) hummock grasslands, while Eucalyptus leucophloia tree steppes occur on ranges."*

4.1.2 Climate

The climate of the Chichester subregion is semi-desert-tropical, with summer rainfall (Kendrick and McKenzie 2003). The area typically experiences a 7-8 month dry season extending from April to November, with the wet season occurring from December to March. These climate patterns are reflected in the long-term climate averages for the survey area, based on data from the nearest Bureau of Meteorology weather station at Newman (Figure 4.1).

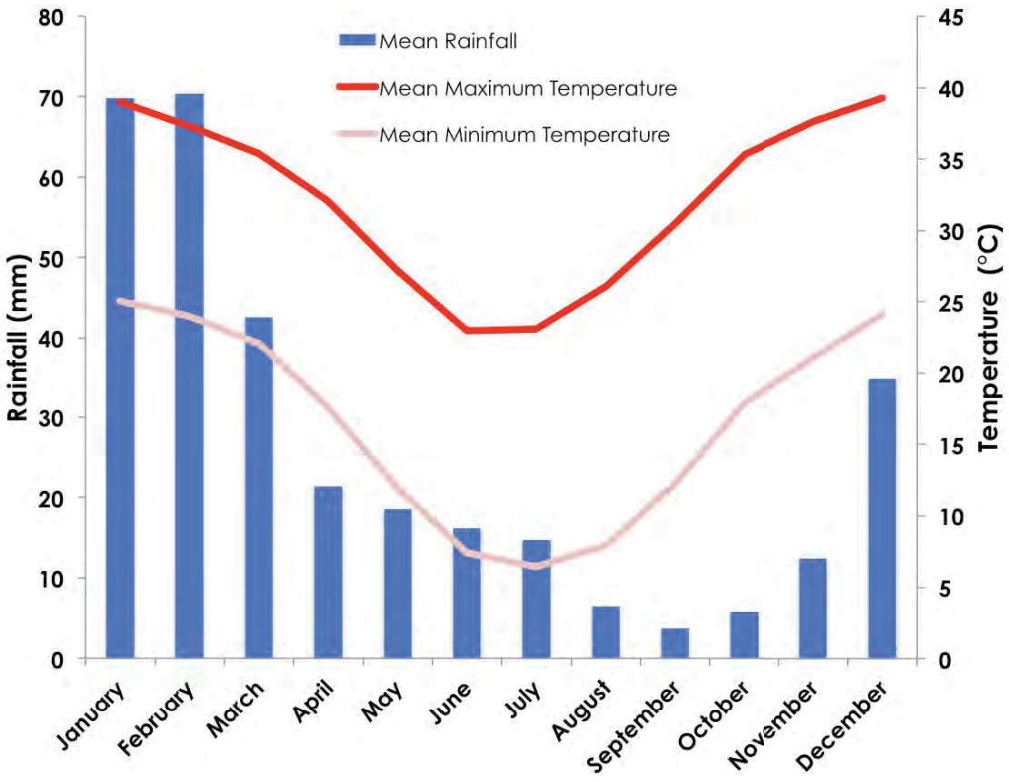


Figure 4.1: Monthly long-term climate averages recorded at the Newman Aero weather station. (Rainfall: 1971-2020, Temperature: 1996-2020). Data supplied by the Bureau of Meteorology (2020).

4.1.3 Land Systems

Land systems are composed of repeating patterns of topography, soils and vegetation, which are described as a series of land units (Christian and Stewart 1953). A total of 105 land systems have been identified and mapped in the Pilbara bioregion by the then Department of Agriculture. Land systems mapping covering the survey area was prepared by van Vreeswyk et al. (2004).

Eleven land systems are mapped within the survey and contextual areas. The most extensive of these is the Rocklea land system, which accounts for 27.1% of the total survey area (Table 4.1; Figure 4.2). Only a small proportion (<1%) of the extent of each land system in the Chichester subregion is intersected by the survey area.

4.1.4 Geology

Mapping of the surface geological units in the locality was prepared based on data from Stewart et al. (2008). Ten geological units were mapped within the survey and contextual areas (Table 4.2, Figure 4.3), while three additional units occur only in the contextual area (Awk: Kelly Group volcaniclastic rock, sandstone, siltstone, shale, chert; Awnc: Coondamar formation mafic schist, felsic schist, amphibolite, pelite, phyllite; and Czl: lateritic duricrust).

The dominant surface geology types in the survey area were the sandstone and shale units Awfh and Awfj (comprising 21.7% and 18.9% of the survey area, respectively).

4.1.5 Soils

Soil units have been mapped by Northcote et al. (1960). Seven broad soil types have been mapped within the survey and contextual areas (see Table 4.3), while a further five soil types occur in the broader study area (Figure 4.4). The dominant units in the survey area comprise the stony pediments and hills unit Oa11, which make up over a third of the survey area, and steep hills and low ranges of unit Fa28, which comprise another quarter.

Table 4.1: Description of land systems within the survey area.
Data from Department of Agriculture WA (van Vreeswyk et al. 2004).

Land System	Description	Extent in Chichester Subregion (ha)	Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area		Extent in Survey Area as a Proportion of the Local Area (%)	Extent in Survey Area as a Proportion of the Chichester Subregion (%)
				Area (ha)	Proportion (%)		
Bonney	Low rounded hills and undulating stony plains supporting soft spinifex grasslands.	70,517	1,181.0	202.7	8.7	17.2	0.29
Capricorn	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.	482,691	1,379.7	272.2	11.7	19.7	0.06
Granitic	Rugged granitic hills supporting shrubby hard and soft spinifex grasslands.	402,166	1,547.3	219.6	9.5	14.2	0.05
McKay	Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands with acacias and occasional eucalypts.	302,619	2,239.6	396.4	17.1	17.7	0.13
Mosquito	Stony plains and prominent ridges of schist and other metamorphic rocks supporting shrubby hard spinifex grasslands.	182,636	1,039.7	250.4	10.8	24.1	0.14
Newman	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.	41,292	357.4	25.6	1.1	7.2	0.06
River	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	264,803	521.2	87.3	3.8	16.7	0.03
Robe	Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.	25,186	354.8	84.7	3.7	23.9	0.34
Rocklea	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	2,125,326	4,246.9	629.5	27.1	14.8	0.03
Taylor	Stony plains and isolated low hills of sedimentary rocks supporting hard and soft spinifex shrubby grasslands.	11,065	497.8	97.9	4.2	19.7	0.88
Wona	Basalt upland gilgai plains supporting Roebourne Plains grass and Mitchell grass tussock grasslands, minor hard spinifex grasslands or annual grasslands/herbfields.	178,264	151.7	53.5	2.3	35.3	0.03

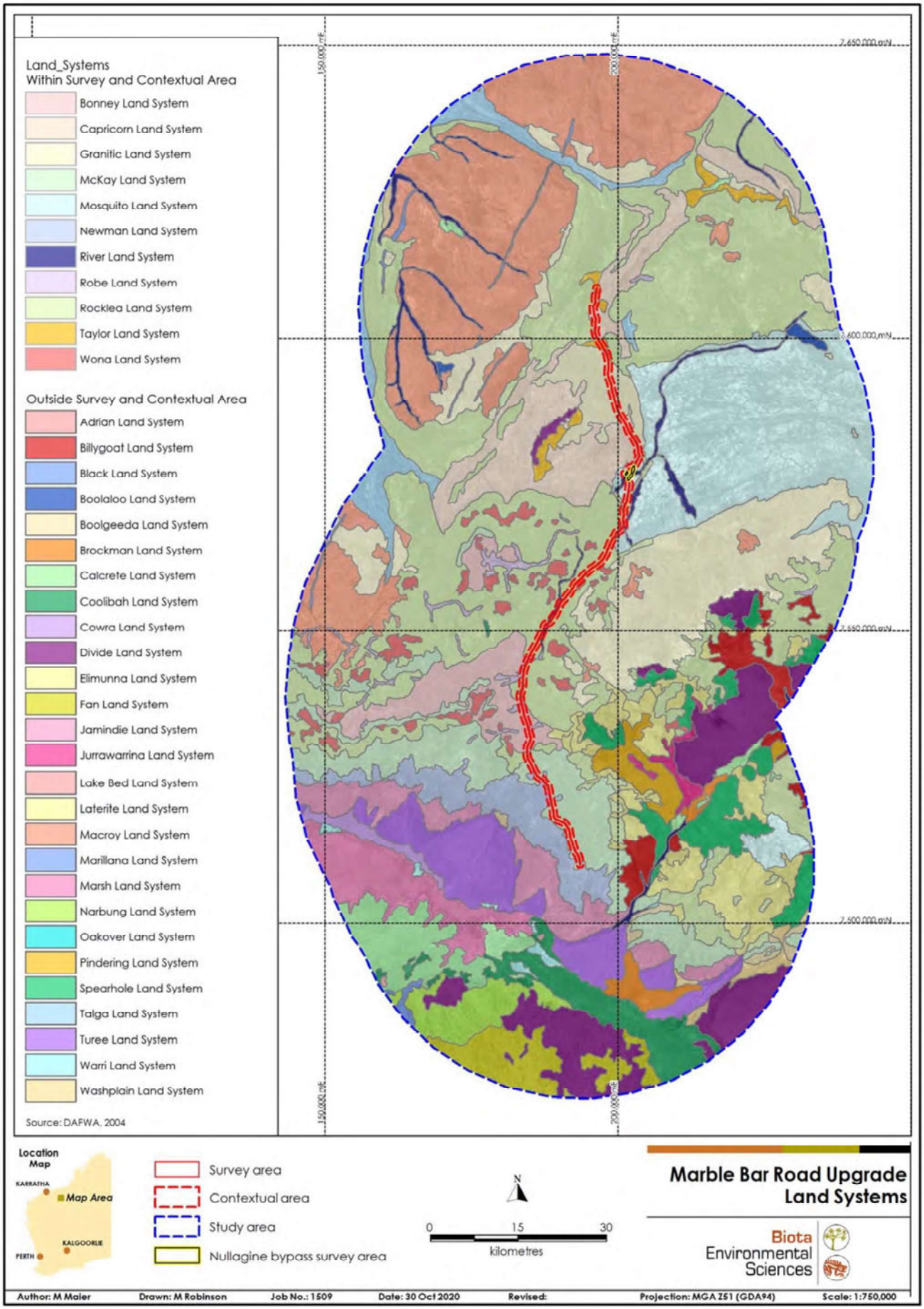


Figure 4.2: Land systems mapping of the study area.

Table 4.2: Description and extent of geological units within the survey area.
Data from Geoscience Australia (Stewart et al. 2008).

Geological Unit	Description	Extent in Survey Area		Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area as a Proportion of the Local Area (%)
		Area (ha)	Proportion (%)		
Abfk	Basalt, andesite, dacite, high-Mg basalt, rhyolite; basaltic agglomerate; dolerite; grey carbonate rock with microbial laminations and stromatolites; sandstone; pillow breccia; tuff, limestone, conglomerate	198.2	8.5	1,259.8	15.7
Abfm	Massive, vesicular and amygdaloidal basalt, basaltic andesite, and andesite, minor dacite, dolerite sills; bedded lapilli, vitric, crystal and lithic tuff, volcaniclastic siltstone, shale, chert, sandstone, dolomite	353.5	15.2	2,423.9	14.6
Abfr	Massive, porphyritic, vesicular, amygdaloidal and doleritic basalt; some high-Mg basalt, agglomerate, volcanic breccia, tuff, mafic wacke, shale, polymictic conglomerate and sandstone, siliceous limestone and dolomite	63.8	2.7	451.1	14.1
Asnm	Sandstone, siltstone, shale, turbidite	379.0	16.3	1,732.3	21.9
Awfh	Sandstone, siltstone, shale, lithic wacke, mudstone, arkose, calcareous beds, conglomerate; porphyry, porphyry breccia; quartzite; dacitic to rhyolitic lavas; quartz-feldspar-mica schist; boulder breccia; basalt; felsic pyroclastics, ultramafic lava	504.2	21.7	2,931.6	17.2
Awfj	Shale, sandstone, siltstone, mudstone, dolomite, local microbanded chert, jaspilite, conglomerate; fine-grained massive rhyolite; mafic tuff with local accretionary lapilli and agglomerate; thin basalt/dolerite and andesitic basalt flows	437.7	18.9	2,585.3	16.9
Awft	Pisolitic tuff, siliceous limestone and dolomite, mudstone, tuffaceous shale, siltstone, sandstone, volcaniclastic sandstone and siltstone, calcareous sandstone, local basalt and basaltic breccia, chert, local conglomerate, shale, jasper	166.6	7.2	789.3	21.1
Czlr	Pisolitic, oolitic, and massive limonite, goethite, and hematite deposits containing fossil wood fragments; iron ore	113.1	4.9	594.5	19.0
Qa	Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted	49.3	2.1	232.1	21.3
Qrc	Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite	54.4	2.3	328.8	16.5

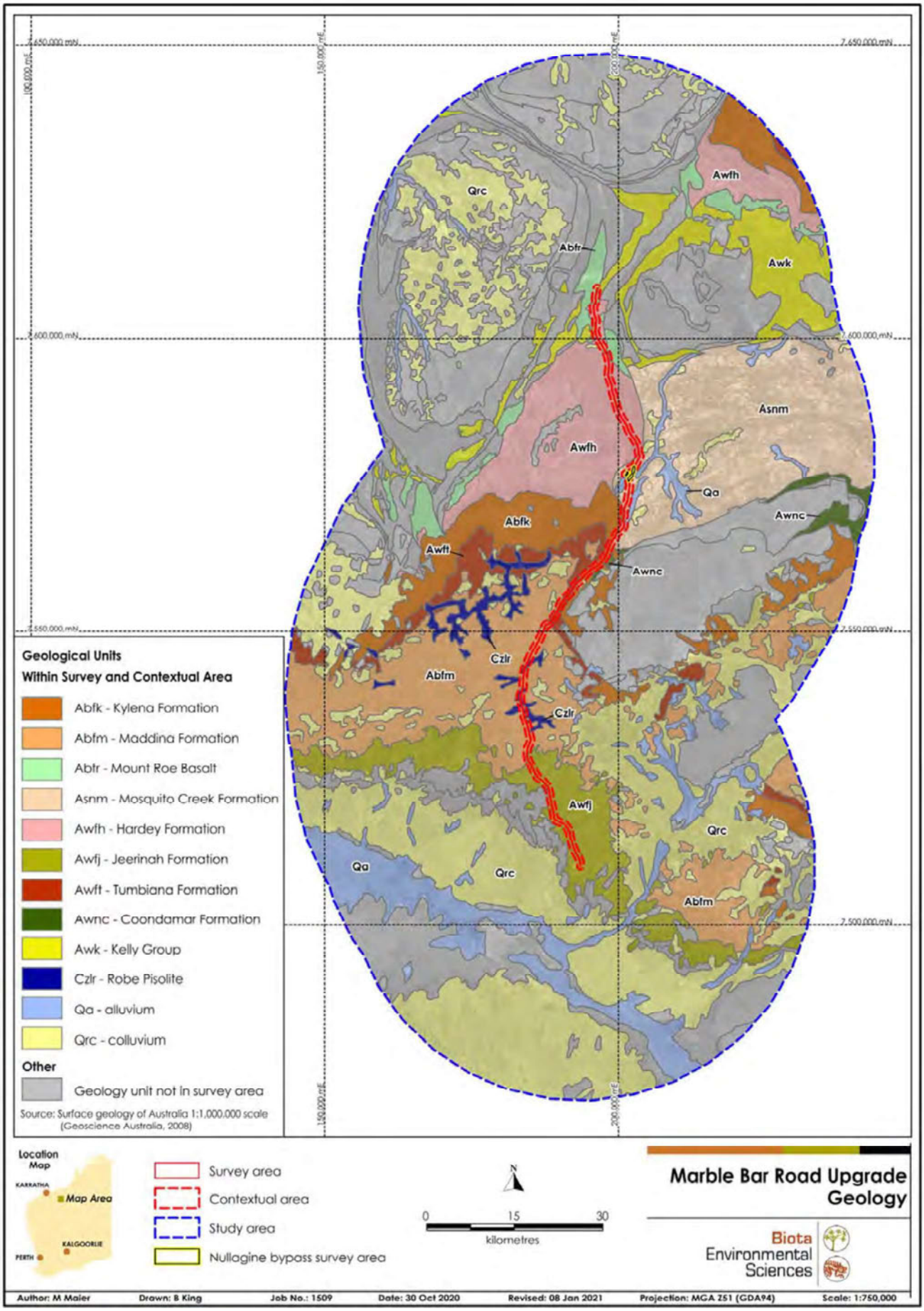


Figure 4.3: Geological units of the study area.

Table 4.3: Description and extent of soil units within the survey area.
Data from Northcote et al. (1960).

Soil Unit	Description	Extent in Survey Area (ha)		Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area as a Proportion of the Local Area (%)
		Area (ha)	Proportion (%)		
Fa14	Steep hills and steeply dissected pediments on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations; some narrow winding valley plains: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. (Dr2.33 and Dr2.32) soils which occur on the pediments are more extensive than in unit Fa13. (Um5.52) and (Uf6.71) soils occur on the valley plains.	83.8	3.6	567.1	14.8
Fa28	Steep hills and low ranges associated with various rocks including dolomite and some chert breccia; exposures of rock are extensive and soils are shallow and stony: chief soils are shallow stony earthy loams (Um5.51). Other soils include shallow stony forms of (Dr2.32).	603.6	26.0	3,566.3	16.9
Fa29	Steep stony hills and low ranges on highly folded quartzites, shales, and slates with extensive areas of rock exposures; small valley plains are included; soils are generally stony and shallow: chief soils are shallow stony earthy loams (Um5.51). Other soils include (Dr2.32), (Gn2.1), and (Uc5.11).	433.9	18.7	2,085.6	20.8
Gf1	Steep ranges on basic lavas along with dolomites, tuff, banded iron formations, and dolerite dykes, with some narrow valley plains and high-level gently undulating areas of limited extent. The soils are generally shallow and stony and there are large areas without soil cover: chief soils are brown loams (Um6.23) along with significant areas of earthy loam (Um5.51) soils. (Dr2.33) soils occur on lower slopes with (Uf6.71) and (Ug5.37) soils on valley floors.	0.8	0.03	92.6	0.8
Mz25	Plains associated with the Fortescue valley; there is a surface cover of stony gravels close to the ranges and hills: chief soils are acid red earths (Gn2.11) with some neutral red earths (Gn2.12); red-brown hardpan is absent. Associated are areas of calcareous earths (Gc) and loams (Um1) on calcrete (kunkar) and some hard red (Dr) soils around creek lines.	7.6	0.3	81.5	9.3
Oa11	Dissected stony pediments and hills occurring at foot of unit Gfl; some residuals of more resistant rocks occur as mesas. On deeply dissected areas lime is released from weathering of more basic rocks: chief soils are hard alkaline red soils (Dr2.13) and other (Dr) soils. There are also shallow (Um5.51) and (Uc) soils associated with rock outcrop; some cracking clays (Ug5.37) on pediments associated with basic rocks; and some shallow calcareous loam soils (Um1.2).	874.5	37.7	5,241.9	16.7
Oc70	Dissected pediments and low stony hills associated with cherts, jaspilites, and iron ore formations; much coarse surface gravel: chief soils are hard alkaline red soils (Dr2 33) along with some (Dr2.32) and (Um5.52) soils.	315.7	13.6	1,882.1	16.8

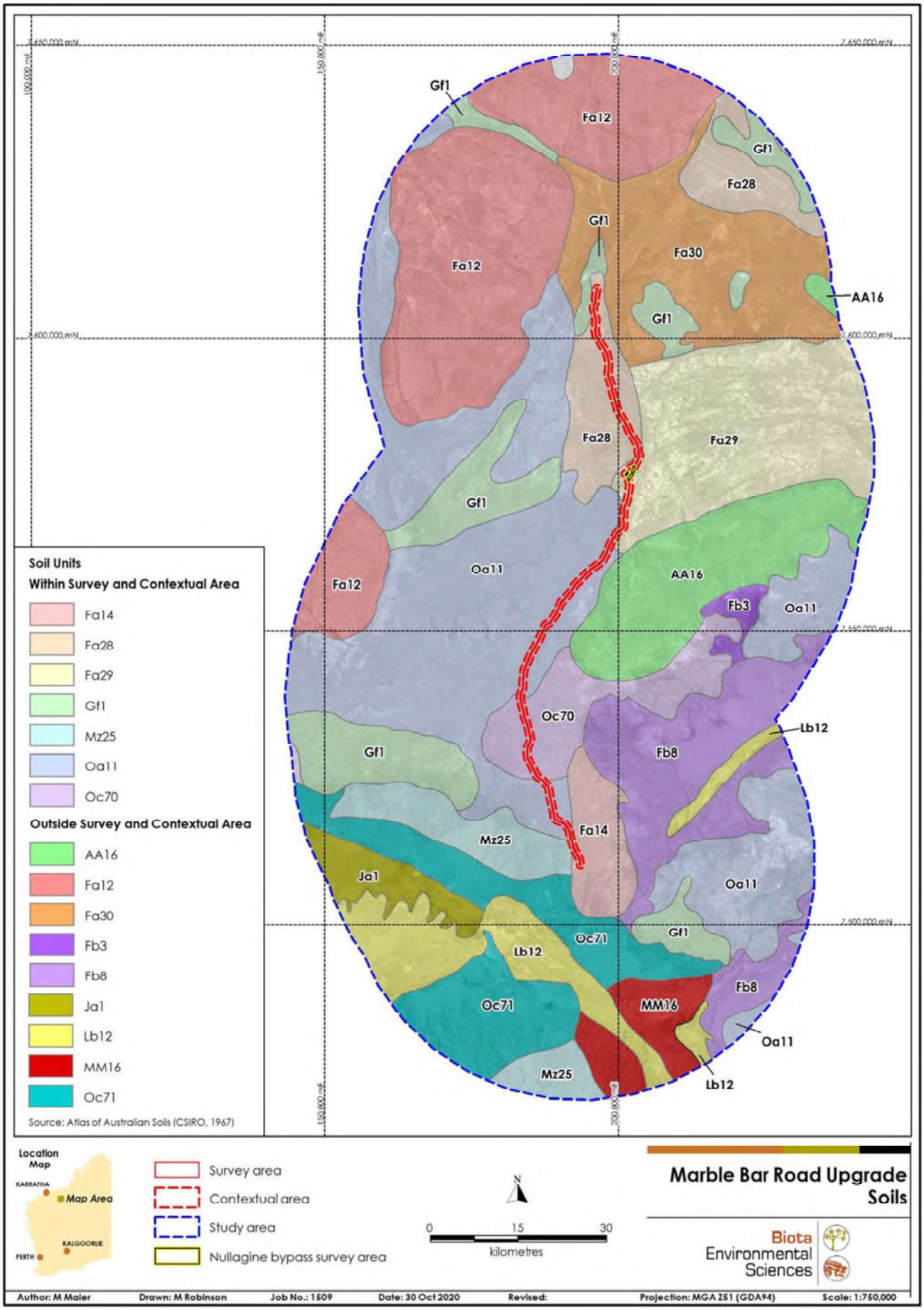


Figure 4.4: Soil units of the study area.

4.1.6 Hydrology

The survey area is broadly placed between Spinaway Creek, a tributary of Emu Creek feeding into the Coongan River to the northwest; and Kulbee Creek, a tributary of the Fortescue River, which drains into the Fortescue Marsh to the south. The Nullagine River is the major drainage through the area, flowing northeast; this river carries heavy flow through the wet season, and intersects the survey area at multiple points (see Figure 4.5). Various other named creeks intersect the survey area and/or contextual area, including Spinaway Creek, Taylor Creek, Cajuput Creek, Daylight Creek, Wild Dog Creek, Christmas Creek and Kulbee Creek, along with tributaries of the Fortescue River.

4.1.7 Conservation and Heritage Areas

There is no formally gazetted conservation tenure within the study area, with the nearest reserve being Karijini National Park, located approximately 120 km west. However, the Fortescue Marsh, located approximately 25 km southwest of the survey area, and the former Meentheena pastoral station, located approximately 21 km northeast of the survey area, are both lands of interest to DBCA and proposed for inclusion in the conservation estate (Figure 4.5). The Fortescue Marsh is also listed on the Directory of Important Wetlands in Australia (DIWA), and is proposed for listing as a Wetland of International Importance under the Ramsar Convention (DoAWE 2020a).

Several registered Aboriginal heritage sites occur within the survey area, including Cajuput Spring Creek, Daylight Creek, and the Mankarlyirrkurra ethnographic site complex (DAA 2020). These are not discussed further in this report.

4.1.8 Pre-European Vegetation

Broad-scale vegetation mapping for the locality has been prepared at the 1:1,000,000 scale based on the work of J.S. Beard for the Pilbara (Beard 1975a). The survey area includes four of Beard's vegetation associations (Table 4.4), while two additional vegetation associations, Fortescue Valley 562 and George Ranges 171, occur in close proximity (see Figure 4.6). Three quarters of the survey area was mapped as shrub steppe of Kanji (*Acacia inaequilatera*) over soft spinifex (*Triodia epactia*) and *Triodia wiseana* on basalt.

The pre-European and current extents of Beard's vegetation associations have been calculated using interpretation of imagery to determine areas that have been cleared (see Shepherd et al. 2002, and Government of Western Australia 2018). These sources indicated that over 99% of the extent of each of these units remains uncleared.

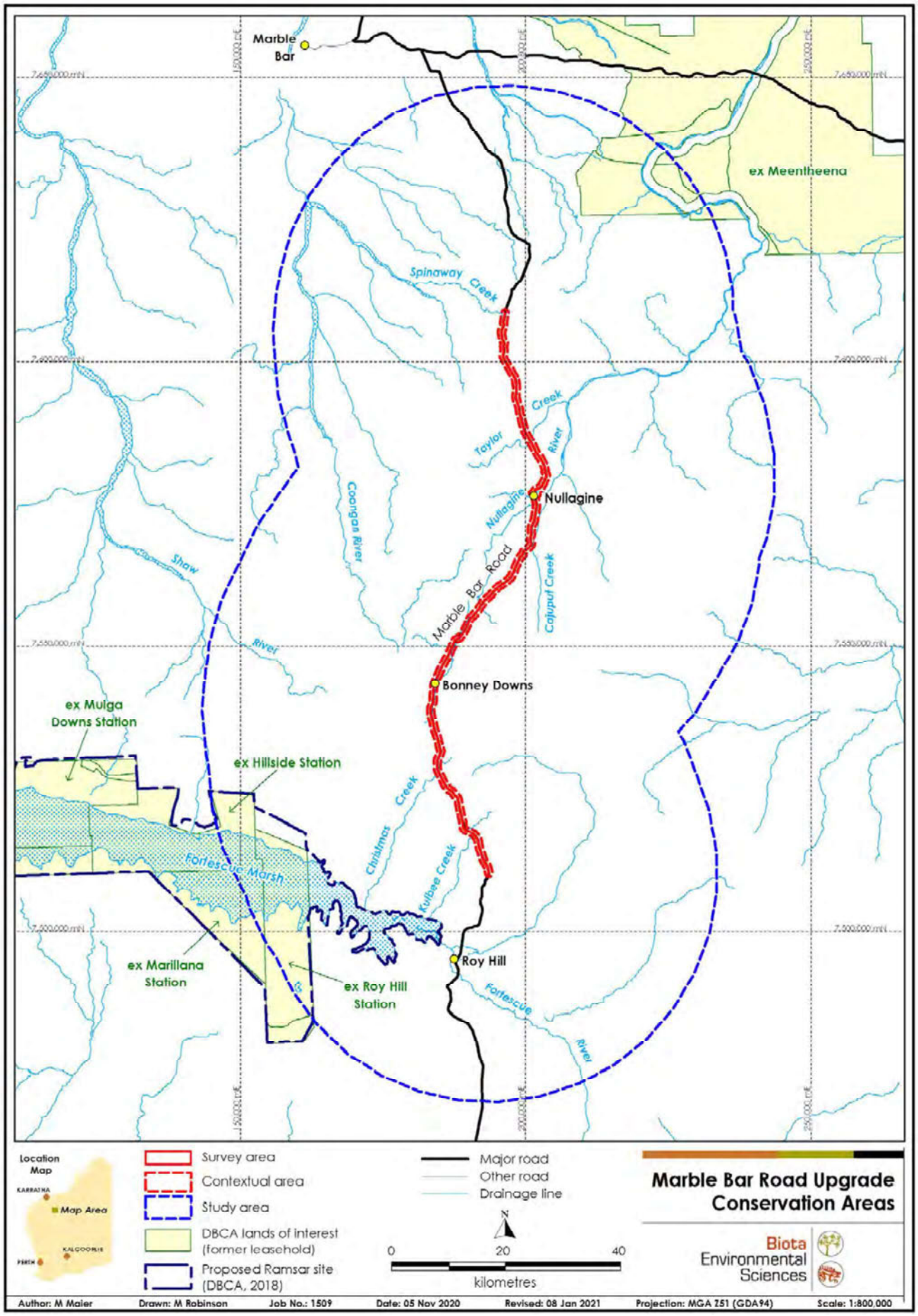


Figure 4.5: Conservation areas within the study area.

Table 4.4: Description and extent of Beard vegetation units within the survey area.
Data from Beard (1975b)

Vegetation Association	Description	Extent in Survey Area		Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area as a Proportion of the Local Area (%)	Extent in Chichester Subregion (ha)	Extent in Survey Area as a Proportion of the Chichester Subregion (%)
		Area (ha)	Proportion (%)				
Abydos Plain – Chichester 93	Hummock grasslands, shrub steppe; Kanji (Acacia inaequilatera) over soft spinifex (Triodia epactia)	129.0	5.6	774.5	16.7	2,936,732	<0.01
Abydos Plain – Chichester 173 and Chichester Plateau 173	Hummock grasslands, shrub steppe; Kanji over soft spinifex and *Triodia wiseana* on basalt	1,712.5	73.8	10,363.7	16.5	1,739,190	0.10
Abydos Plain – Chichester 190	Hummock grasslands, sparse shrub steppe; *Acacia bivenosa* and *A. trachycarpa* over hard spinifex, *Triodia wiseana*. Very poor rocky country on gneiss.	478.3	20.6	2,349.8	20.4	169,051	0.28

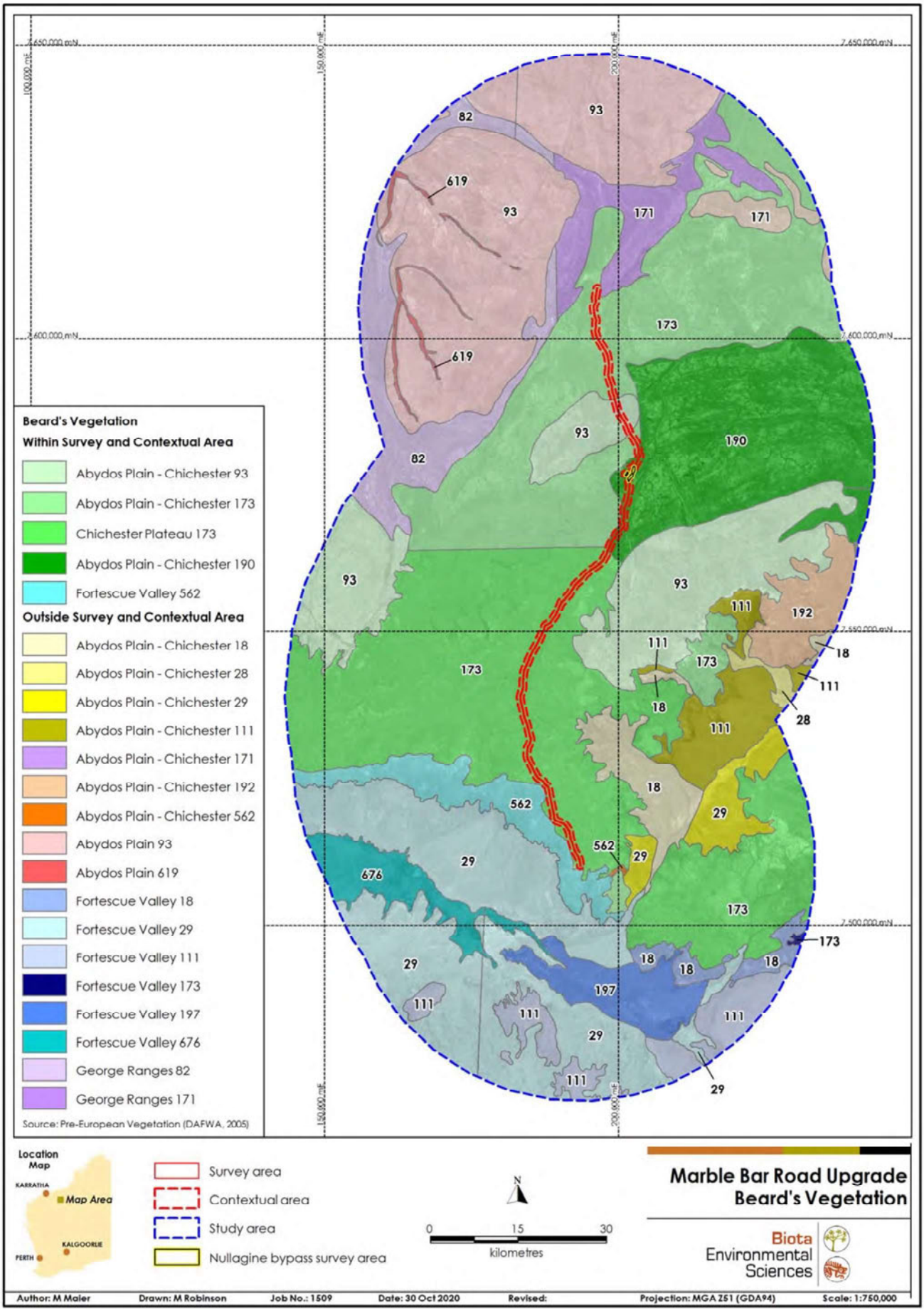


Figure 4.6: Beard's vegetation mapping within the study area.

4.1.9 Significant Communities in the Locality

This section describes vegetation of significance previously recorded within the survey area, or known from the study area, based on the desktop assessment (see Section 3.1 and Table 3.2).

4.1.9.1 Threatened Ecological Communities

No TECs have been recorded from the study area. Only two TECs are listed for the Pilbara: the "Themeda grasslands on cracking clays (Hamersley Station, Pilbara)", and the "Ethel Gorge aquifer stygobiont community". Both of these TECs are restricted the Hamersley subregion and would not occur in the survey area.

4.1.9.2 Priority Ecological Communities

Forty-three PECs are listed for the Pilbara bioregion (DBCA 2020a). One of these intersects the central section of the survey area (Figure 4.7):

- The Priority 3 "Stony saline plains of the Mosquito Land System" PEC is described as a "*Triodia longiceps* grassland with scattered *Maireana melanocoma* and *Sclerolaena* spp. and includes the Priority 1 flora taxa *Atriplex spinulosa* and *Ptilotus wilsonii*. Dissected by drainage lines. Dominated by (but not limited to) *Melaleuca eleuterostachya* and *Acacia bivenosa* occurring on saline red brown non-cracking clays with a mantle of quartz gravel and neutral subsurface soil material on level to undulating plains." (DBCA 2020a).

One other PEC occurs within the study area, but does not intersect the survey area or contextual area (Figure 4.7):

- The Priority 1 "Fortescue Marsh (Martuyitha) (Marsh Land System)" PEC is described as "an extensive, episodically inundated samphire marsh at the upper terminus of the Fortescue River and the western end of Goodiadarrie Hills. It is regarded as the largest ephemeral wetland in the Pilbara. It is a highly diverse ecosystem with fringing mulga woodlands (on the northern side), samphire shrublands and groundwater dependant riparian ecosystems. It is an arid wetland utilized by waterbirds and supports a rich diversity of restricted aquatic and terrestrial invertebrates. Recorded locality for night parrot and bilby and several other threatened vertebrate fauna. Endemic *Eremophila* species, populations of priority flora and several near-endemic and novel samphires" (DBCA 2020a). This PEC is located approximately 7 km southwest of the southern tip of the survey area; no associated habitat extends into the survey area.

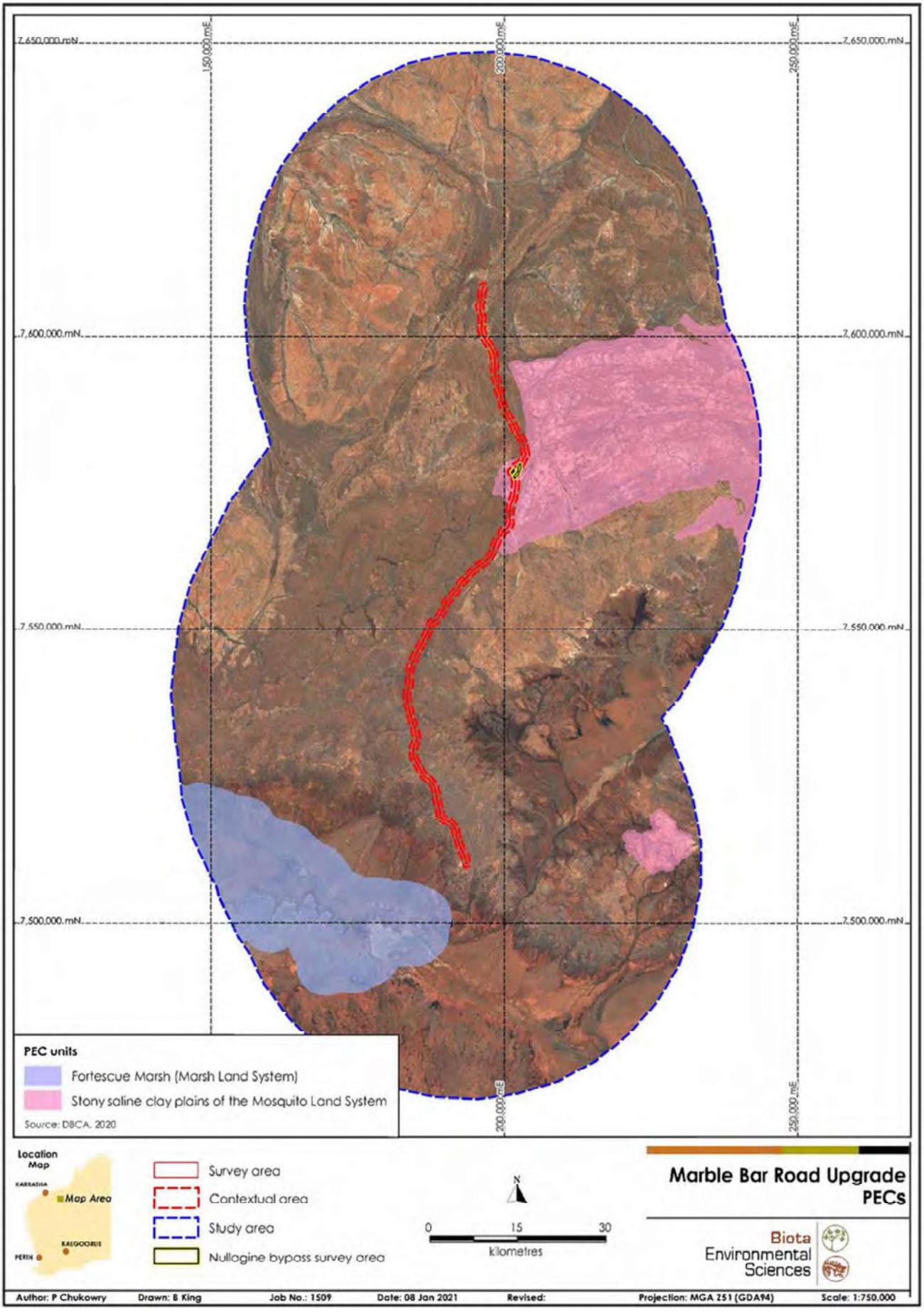


Figure 4.7: PECs recorded from the study area.

4.1.10 Significant Flora Known from the Locality

This section describes species of significance previously recorded within the survey area, or assessed as having the potential to occur (see Section 3.1.3, and Appendices 2, 3 and 6).

4.1.10.1 Threatened Flora

No Threatened flora species have previously been recorded from the study area. Four such species are currently listed for the Pilbara but only one, *Seringia exastia*, would have the potential to occur in the survey area on the basis of its distribution (Table 4.5). *Seringia exastia* was listed as Threatened when it was only known from a few locations in the vicinity of Broome, however the common and widespread species *Seringia elliptica* was recently incorporated into *S. exastia* following a genetic study (Binks et al. 2020). Given the much broader distribution of the resulting taxon, it is no longer considered to be of significance (Binks et al. 2020), and it is expected that *S. exastia* will be de-listed in the near future. This species is therefore not considered further in this report.

Table 4.5: Threatened flora species listed for the Pilbara bioregion.

Species (Common Name)	Significance †		Distribution Overlaps Survey Area?
	State	Commonwealth	
Aluta quadrata	EN	–	No – restricted to southern Pilbara / northern Gascoyne.
Quoya zonalis (Pilbara Foxglove)	EN	EN	No – restricted to ranges of hills west of Marble Bar; closest records over 90 km northwest of the survey area.
Seringia exastia (Fringed Fire-bush)	CR	CR	Yes – very broad distribution over 1,200 km from Broome to near Menzies.
Thryptomene wittweri (Mountain Thryptomene)	VU	VU	No – known from a few widely separated locations in the southern Pilbara, western Gascoyne, and western Little Sandy Desert.

† CR = Critically Endangered, EN = Endangered, VU = Vulnerable.

4.1.10.2 Priority Flora

A literature review of previous surveys conducted in the locality identified 12 Priority flora species that have been recorded in the study area (see Table 3.2), comprising:

- six Priority 1 species:
  - *Acacia aphanoclada,*
  - *Acacia cyperophylla* var. *omeareana*,
  - *Atriplex spinulosa,*
  - *Eremophila pilosa*,
  - *Ptilotus wilsonii,*
  - *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795;
- three Priority 3 species:
  - *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727),
  - *Rhagodia* sp. Hamersley (M Trudgen 17794),
  - *Themeda* sp. Hamersley Station (M.E. Trudge 11431); and
- three Priority 4 species:
  - *Acacia bromilowiana*,
  - *Eremophila youngii* subsp. *lepidota*, and
  - *Goodenia nuda.*

Database searches (WA Herbarium, DBCA Threatened and Priority Flora list, NatureMap and EPBC Protected Matters) returned an additional 33 Priority species from the survey area locality. A list of these species, along with an assessment of their likelihood of occurrence in the survey area, is

presented in Appendix 3. The locations of records identified through the desktop study are mapped in Appendix 2.

4.1.11 Significant Fauna Known from the Locality

4.1.11.1 Potential Fauna Assemblage

Database and literature searches yielded a total of 338 vertebrate species with the potential to occur in the survey area, 33 of which are listed as significant (Table 4.6). A further 24 avifauna taxa are listed as 'Marine' under the EPBC Act, despite these species not using marine habitats. In fact, fewer than half of the 293 taxa listed by the EPBC Act as Marine gain all or most of their food at sea (Garnett 2013). As the survey area does not encompass any marine environs, these taxa are not considered further in this report.

The combined species list is provided in Appendix 4. Locations of previous significant fauna records in the study area are mapped in Appendix 2 (where available).

Table 4.6: Overview of vertebrate fauna species with potential to occur in the survey area.

Fauna Group	Status	No. of Species	No. of Significant Species
Ground-dwelling Mammals	Native	25	7
	Introduced	10 (inc. 1 naturalised exotic)	0
Bats	Native	15	2
Birds	Native	167	21*
Reptiles	Native	111	3
Amphibians	Native	10	0
*excluding Marine	**Total**	**338**	**33***

4.1.11.2 Likelihood of Occurrence of Significant Fauna

Appendix 6 summarises the likelihood of occurrence of the 33 significant species that were returned from the desktop assessment.

Prior to undertaking the field survey, 11 of the 33 species were considered likely to occur, and it was considered that a further 11 species may occur; the remaining 11 species were considered unlikely to occur (Appendix 6). Significant fauna are discussed in more detail in Section 4.4.

4.2 Vegetation Results

4.2.1 Overview

Reflecting its location along an existing road, the survey area generally traversed low-lying areas within the landscape, with larger hills typically outside the survey area in the contextual area. Almost one-fifth of the survey area had been cleared; the broad landforms and vegetation types through the remainder of the corridor comprised:

- Hills with boulder or stony substrates supporting spinifex hummock grasslands with a usually sparse overstorey of shrubs and trees; the hummock grassland was usually dominated by *Triodia wiseana* and/or *T. epactia*, sometimes with *T. brizoides* or *T. vanleeuwenii*, (Plate 4.1);
- Stony to gravelly plains supporting spinifex hummock grasslands, usually dominated by *Triodia longiceps* and *T. wiseana*, with a sparse to open cover of shrubs and trees (Plate 4.2);
- Clay plains supporting annual grasses and herbs, which ranged from a dense cover through to patches within open hummock grasslands of *Triodia longiceps* and *T. epactia* (Plate 4.3);
- Mulga (*Acacia aptaneura*) low woodland on plains and occasional rocky knolls (Plate 4.4); and

- Drainage lines, ranging in scale from major drainages (e.g. the Nullagine River) supporting riparian Eucalypt forests, through to minor flowlines with open scrub of mixed wattles and other shrub species (Plate 4.5).

The extent of each mapping unit is presented in Table 4.7 and mapped in Appendix 11. In general, the survey area contained less than a quarter of the mapped extent of most vegetation types in the local area (defined as the survey area plus contextual area combined). Exceptions comprised units P4, P5, D7 and D8, none of which are of particular significance. Individual vegetation types are further described in Section 4.2.2.



Plate 4.1: Vegetation of hills with a boulder substrate (left), compared to a stony substrate (right).



Plate 4.2: Vegetation of gravelly / stony plains.

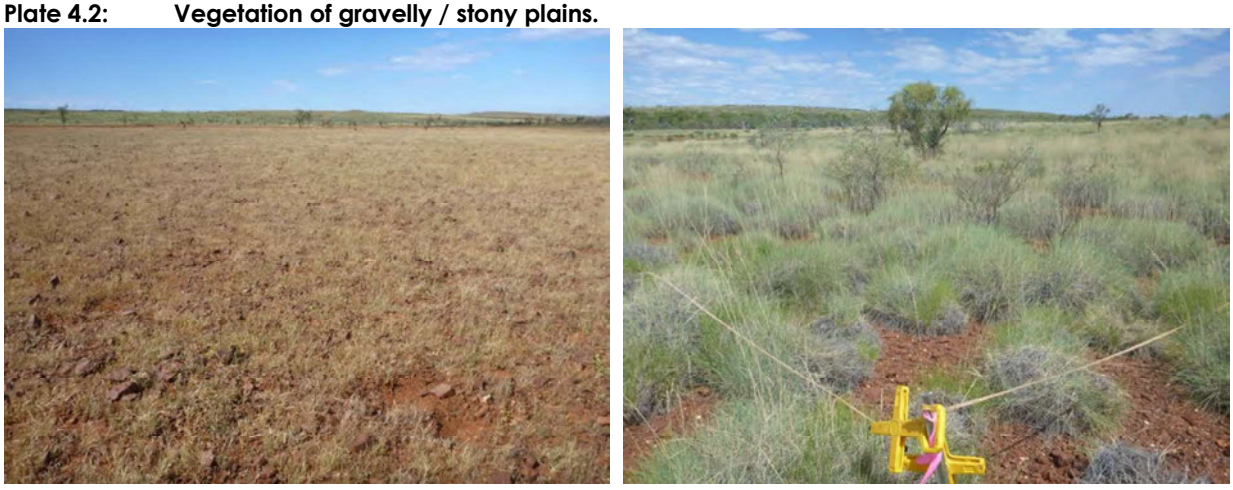


Plate 4.3: Vegetation of clay plains: with herbs and grasses dominating (left), and occurring in patches within an open hummock grassland (right).



Plate 4.4: Mulga woodland vegetation on plains (left) and knolls (right).



Plate 4.5: Vegetation of drainage lines: the Nullagine River (left), compared to a minor flowline (right).

Table 4.7: Extent of vegetation types and other mapping units in the survey area and contextual area.

Code	Mapping Unit	Extent in Survey Area		Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area as Proportion of Local Area
		Area (ha)	Proportion of Survey Area		
Vegetation of Hills					
H1	*Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland	105.7	4.6%	935.7	11.3%
H2	*Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland	153.4	6.6%	1,364.2	11.2%
H3	*Acacia inaequilatera* tall open shrubland over *Triodia wiseana, T. epactia* hummock grassland	55.6	2.4%	279.6	19.9%
H4	*Triodia epactia* hummock grassland	73.3	3.2%	532.3	13.8%
H5	*Acacia orthocarpa* open shrubland over *Triodia epactia* hummock grassland	72.7	3.1%	773.4	9.4%
H6	*Acacia inaequilatera* scattered tall shrubs to tall open shrubland over *Triodia epactia* hummock grassland	408.4	17.6%	3,228.1	12.7%
H7	*Triodia wiseana, T. scintillans* hummock grassland	146.1	6.3%	1,295.7	11.3%
H8	*Triodia brizoides* hummock grassland	98.3	4.2%	496.8	19.8%
Vegetation of Saline and Gravelly Plains					
P1	*Acacia bivenosa* scattered tall shrubs over *Senna symonii* scattered shrubs over *Triodia longiceps* hummock grassland	130.8	5.6%	605.8	21.6%
P2	*Triodia longiceps, (T. wiseana)* hummock grassland	207.3	8.9%	987.1	21.0%
P3	*Triodia epactia* hummock grassland	45.3	2.0%	366.0	12.4%
P4	*Acacia trachycarpa* open shrubland over *Triodia epactia, T. longiceps* hummock grassland	113.5	4.9%	292.9	38.7%
P5	*Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Triodia wiseana, (T. longiceps)* open hummock grassland	16.7	0.7%	34.6	48.1%
Vegetation of Cracking Clays					
C1	*Triodia longiceps, T. epactia* open hummock grassland with patches of mixed herbland and annual grassland	44.4	1.9%	256.4	17.3%
Mulga Vegetation					
M1	*Acacia aptaneura* scattered low trees to low woodland over *Triodia longiceps, T. epactia* hummock grassland	10.6	0.5%	70.7	15.0%
Vegetation of Drainage Lines					
D1	*Eucalyptus camaldulensis, E. victrix* open forest over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* low open woodland over **Cenchrus* spp. tussock grassland	26.3	1.1%	311.4	8.4%
D2	*Eucalyptus victrix, (Acacia coriacea* subsp. *pendens)* low open woodland over *Triodia longiceps* very open hummock grassland	6.3	0.3%	47.9	13.2%
D3	*Eucalyptus victrix, (Acacia coriacea* subsp. *pendens)* low woodland over *Acacia trachycarpa* open shrubland over *Eriachne benthamii* open tussock grassland with *Triodia longiceps* very open hummock grassland	16.2	0.7%	78.5	20.6%
D4	*Eucalyptus victrix, (Acacia coriacea* subsp. *pendens)* woodland over **Cenchrus ciliaris, *C. setiger, (Eriachne tenuiculmis, Chrysopogon fallax)* tussock grassland with *Cyperus vaginatus* scattered sedges	109.9	4.7%	591.3	18.6%
D5	*Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis, (A. trachycarpa)* tall open scrub over *Themeda triandra, Chrysopogon fallax* open tussock grassland with *Triodia epactia, (T. longiceps)* very open hummock grassland	9.5	0.4%	63.2	15.0%
D6	*Eucalyptus xerothermica* scattered low trees over *Grevillea wickhamii, Acacia ancistrocarpa, A. bivenosa* tall shrubland over **Cenchrus ciliaris, *C. setiger* open tussock grassland	15.9	0.7%	129.6	12.3%
D7	*Eucalyptus leucophloia* subsp. *leucophloia, (E. xerothermica)* low open woodland over *Acacia colei, Acacia ancistrocarpa, A. bivenosa* tall shrubland over *Triodia longiceps* open hummock grassland	3.6	0.2%	11.2	32.5%
D8	**Cenchrus ciliaris, *C. setiger* tussock grassland	18.1	0.8%	63.0	28.8%
Other Mapping Units					
Cleared	Cleared	431.9	18.6%	701.7	61.6%

This page is intentionally left blank.

4.2.2 Description of Vegetation Types

4.2.2.1 Vegetation of Hills

H1	***Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland.**
Distribution and habitat	This vegetation type occurred on silty clays to sandy clay loams on low stony rises and sometimes undulating stony plains throughout the survey area, particularly towards the northern and southern ends (Plate 4.6 and Plate 4.7). The sparse tall shrub layer was dominated by *Acacia bivenosa*, and typically also included scattered *A. inaequilatera*. Scattered lower shrubs of various *Senna* spp. were also typically present.
Other associated species	Shrubs: *Corchorus parviflorus, Hakea lorea* subsp. *lorea, Senna artemisioides* subsp. *helmsii, S. artemisioides* subsp. *oligophylla, S. glutinosa* subsp. *glutinosa* x subsp. x *luerssenii, Sida echinocarpa.* Grasses: *Dichanthium sericeum* subsp. *humilius, Enneapogon caerulescens, Sporobolus australasicus.* Herbs: *Arivela viscosa, Bonamia pilbarensis, Euphorbia australis* var. *subtomentosa, Evolvulus alsinoides* var. *villosicalyx, Goodenia muelleriana, Heliotropium cunninghamii, Polygala glaucifolia, Portulaca oleracea/intraterranea, Sida fibulifera, Tribulus hirsutus.*
Vegetation condition	Excellent to Very Good: **Cenchrus ciliaris* often present, but only in very small amounts; minor signs of grazing by cattle.
Sampling sites	Quadrats MBU03, MBU04, MBU05, MBU21, MBU48, MBU63 and MBU64.



Plate 4.6: Unit H1 (MBU21).



Plate 4.7: Unit H1 (MBU64).

H2	***Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland.**
Distribution and habitat	This vegetation type occurred on low stony hills and ridges throughout the survey area except in the southern 30 km section, occurring on various substrates including calcareous areas and on basalt (Plate 4.8 to Plate 4.11). While *Corymbia hamersleyana* was the most common tree, *Eucalyptus leucophloia* subsp. *leucophloia* was also present in places. The sparse tall shrub layer was dominated by *Acacia inaequilatera,* while the hummock grassland ground layer was dominated by *Triodia wiseana,* usually also with scattered *T. epactia.* Minor flowlines through this vegetation typically supported somewhat higher densities of the shrub species present in the surrounds.

Other associated species	Shrubs: *Acacia acradenia, Corchorus parviflorus, Gossypium australe, Hakea lorea* subsp. *lorea, Indigofera monophylla, Senna artemisioides* subsp. *oligophylla, S. glutinosa* subsp. *glutinosa, Sida echinocarpa, Solanum horridum.* Grasses: *Cymbopogon ambiguus, Enneapogon caerulescens, Sporobolus australasicus.* Sedges: *Bulbostylis barbata.* Herbs: *Arivela viscosa, Boerhavia coccinea, Bonamia pilbarensis, Cucumis variabilis, Euphorbia australis* var. *subtomentosa, Gomphrena cunninghamii, Goodenia muelleriana, Indigofera colutea, Notoleptopus decaisnei, Polygala glaucifolia, Ptilotus auriculifolius, P. clementii, Rhynchosia minima, Tribulus hirsutus.*
Vegetation condition	Excellent to Very Good: typically no signs of disturbance, but sometimes very scattered weeds or signs of cattle.
Sampling sites	Quadrats MBU14, MBU45, MBU53, MBU57, MBU59 and MBU75; relevé REL03.



Plate 4.8: Unit H2 (MBU14).



Plate 4.9: Unit H2 (MBU45).



Plate 4.10: Unit H2 (MBU57).

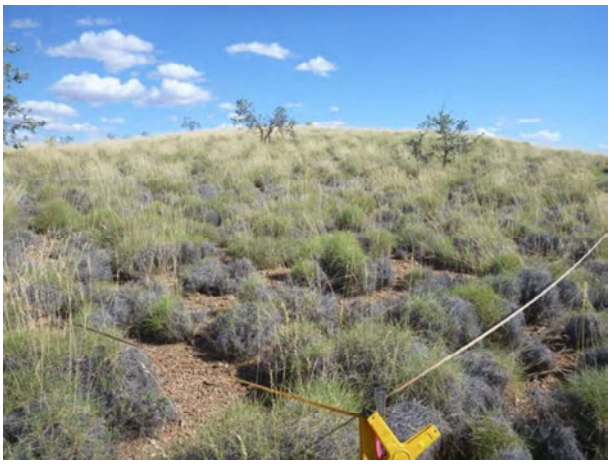


Plate 4.11: Unit H2 (MBU75).

H3	***Acacia inaequilatera* tall open shrubland over *Triodia wiseana, T. epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred on low stony hills through the northern half of the survey area (Plate 4.12 and Plate 4.13). The sparse tall shrub layer sometimes included very scattered *Acacia bivenosa* or *A. aphanoclada* (the latter only in the vicinity of Nullagine), while the hummock grassland ground layer was dominated by a mixture of *Triodia wiseana* and *T. epactia.*

Other associated species	Shrubs: *Corchorus parviflorus, Indigofera monophylla, Ptilotus calostachyus, Senna glutinosa* subsp. *glutinosa.* Grasses: *Cymbopogon ambiguus, Eriachne mucronata.* Herbs: *Arivela viscosa, Bonamia pilbarensis, Ptilotus exaltatus, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356).
Vegetation condition	Typically Excellent to Very Good, with only minor signs of disturbance (scattered weeds, light grazing or minor ground disturbance; ranked as Good in one area with several cleared tracks.
Sampling sites	Quadrats MBU09 and MBU41; relevé REL10.



Plate 4.12: Unit H3 (MBU41).

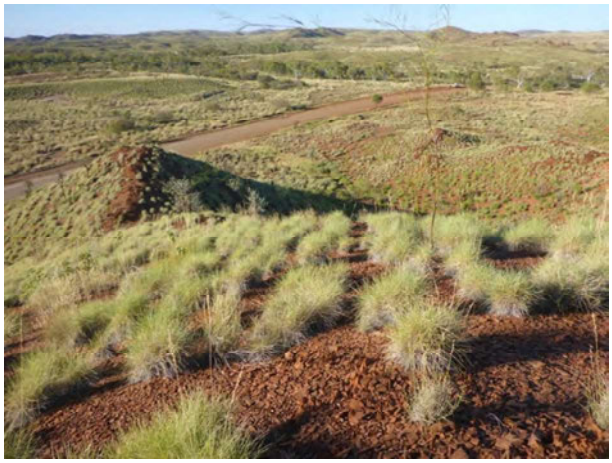


Plate 4.13: Unit H3 (REL10).

H4	***Triodia epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred on low stony hills through the northern quarter of the survey area (Plate 4.14 and Plate 4.15). The only prominent stratum was the hummock grassland ground layer, which was dominated by *Triodia epactia;* trees and shrubs were rare.
Other associated species	Shrubs: *Acacia bivenosa, Corchorus parviflorus, Dampiera candicans, Gossypium australe, Grevillea wickhamii* subsp. *hispidula, Indigofera monophylla, Ptilotus calostachyus, Sida* sp. Pilbara (A.A. Mitchell PRP 1543). Grasses: *Aristida contorta, Eriachne pulchella, Sporobolus australasicus.* Sedges: *Fimbristylis dichotoma, F. simulans.* Herbs: *Bonamia pilbarensis, Goodenia microptera, Heliotropium pachyphyllum, Polycarpaea holtzei, Tribulus hirsutus, Trigastrotheca molluginea.*
Vegetation condition	Excellent to Very Good; occasionally minor evidence of grazing, or historical ground disturbance.
Sampling sites	Quadrats MBU06, MBU07, MBU19 and MBU20.



Plate 4.14: Unit H4 (MBU06).



Plate 4.15: Unit H4 (MBU19).

H5	***Acacia orthocarpa* open shrubland over *Triodia epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred on low stony hills through the northern third of the survey area (Plate 4.16 and Plate 4.17). The open shrubland stratum was dominated by *Acacia orthocarpa*, with both the bushy shrub form and wispy form recorded. The hummock grassland ground layer was dominated by *Triodia epactia*.
Other associated species	Shrubs: *Acacia bivenosa*, *A. pyrifolia* var. *pyrifolia*, *Corchorus parviflorus*, *Gossypium australe*, *Grevillea wickhamii* subsp. *hispidula*, *Indigofera monophylla*, *Senna artemisioides* subsp. *oligophylla*, *S. glutinosa* subsp. *glutinosa*, *Sida* sp. Pilbara (A.A. Mitchell PRP 1543). Grasses: *Aristida contorta*, *Eriachne pulchella*, *Sporobolus australasicus*, *Tripogonella loliiformis*, *Yakirra australiensis* var. *australiensis*. Sedges: *Bulbostylis barbata*, *Fimbristylis dichotoma*. Herbs: *Arivela viscosa*, *Bonamia pilbarensis*, *Heliotropium skeleton*, *Polycarpaea corymbosa* var. *corymbosa*.
Vegetation condition	Usually Excellent; sometimes Very Good, with scattered weeds.
Sampling sites	Quadrats MBU01, MBU08, MBU11, MBU16 and MBU26.



Plate 4.16: Unit H5, with wispy form of *Acacia orthocarpa* (MBU16).



Plate 4.17: Unit H5, with bushy form of *Acacia orthocarpa* (MBU26).

H6	***Acacia inaequilatera* scattered tall shrubs to tall open shrubland over *Triodia epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred through the northern half of the survey area on low hills with a substrate of basalt boulders, and occurred elsewhere on stony hills through all but the southernmost 10 km of the survey area (Plate 4.18 to Plate 4.21). The tall shrubland stratum varied in cover but was dominated by *Acacia inaequilatera*. The hummock grassland stratum was dominated by *Triodia epactia*.
Other associated species	Shrubs: *Abutilon* sp. Dioicum (A.A. Mitchell PRP 1618), *Corchorus parviflorus, Gossypium australe, Grevillea pyramidalis* subsp. *leucadendron, G. wickhamii* subsp. *hispidula, Indigofera monophylla, Senna glutinosa* subsp. *glutinosa, Sida echinocarpa*. Grasses: *Cymbopogon ambiguus, Sporobolus australasicus*. Herbs: *Alysicarpus muelleri, Arivela viscosa, Boerhavia coccinea, Bonamia pilbarensis, Cucumis variabilis, Euphorbia australis* var. *subtomentosa, Evolvulus alsinoides* var. *villosicalyx, Gomphrena cunninghamii, Indigofera colutea, Polycarpaea corymbosa* var. *corymbosa, Portulaca oleracea/intraterranea, Ptilotus auriculifolius, Rhynchosia minima, Tribulus hirsutus, Trichodesma zeylanicum* var. *zeylanicum*.
Vegetation condition	Usually Excellent or Very Good, with very occasional weeds present, and/or minor signs of grazing; ranked as Good in areas with considerable ground disturbance.
Sampling sites	Quadrats MBU13, MBU17, MBU23, MBU24, MBU25, MBU29, MBU37, MBU39, MBU40, MBU44, MBU56, MBU61 and MBU72; relevé REL11.



Plate 4.18: Unit H6 (MBU24).



Plate 4.19: Unit H6 (MBU13).



Plate 4.20: Unit H6 (MBU44).



Plate 4.21: Unit H6 (MBU72).

H7	***Triodia wiseana, T. scintillans* hummock grassland.**
Distribution and habitat	This vegetation type occurred only through the southernmost 17 km section of the survey area, on low stony hills and stony undulating plains (Plate 4.22 and Plate 4.23). The dominant stratum was the hummock grassland of *Triodia wiseana* and *T. scintillans,* which also typically contained occasional *T. longiceps.* Shrubs and trees were very sparse.
Other associated species	Shrubs: *Acacia inaequilatera, Indigofera monophylla, Ptilotus astrolasius, Senna glutinosa* subsp. *glutinosa, S. glutinosa* subsp. *pruinosa, Senna glutinosa* subsp. *glutinosa* x subsp. x *luerssenii, S. notabilis, Tribulus suberosus*. Grasses: *Aristida contorta, Enneapogon polyphyllus, Eriachne pulchella, Paspalidium clementii, Sporobolus australasicus.* Sedges: *Bulbostylis barbata, Fimbristylis simulans.* Herbs: *Arivela viscosa, Boerhavia coccinea, Cucumis variabilis, Gomphrena kanisii, Goodenia microptera, Oldenlandia crouchiana, Polycarpaea holtzei, Polygala glaucifolia, Portulaca oleracea/intraterranea, Ptilotus aervoides, P. clementii, P. exaltatus, Tribulus hirsutus, Trichodesma zeylanicum* var. *zeylanicum.*
Vegetation condition	Usually Excellent to Very Good, with only scattered weeds or minor signs of grazing; ranked as Good in some narrow strips along the existing road, reflecting ground disturbance.
Sampling sites	Quadrats MBU60, MBU67, MBU68 and MBU71.



Plate 4.22: Unit H7 (MBU68).



Plate 4.23: Unit H7 (MBU71).

H8	***Triodia brizoides* hummock grassland.**
Distribution and habitat	This vegetation type occurred in patches through the survey area, mainly on low stony hills around Nullagine and on some hills in the southern section of the survey area (Plate 4.24 and Plate 4.25). The hummock grassland stratum was dominated by *Triodia brizoides,* with small amounts *of T. longiceps, T. wiseana* and *T. epactia.* Occasional trees of *Eucalyptus leucophloia* subsp. *leucophloia* were recorded, and shrubs were usually sparse. Note that *Acacia aphanoclada* was only recorded in areas around Nullagine.
Other associated species	Shrubs: *Acacia aphanoclada, A. bivenosa, A. inaequilatera, A. synchronicia, Indigofera monophylla, Maireana melanocoma, Pluchea tetranthera, Senna artemisioides* subsp. *oligophylla* x *S. symonii, S. glutinosa* subsp. *glutinosa, S. glutinosa* subsp. *pruinosa, Tribulus suberosus*. Grasses: *Eriachne pulchella, Sporobolus australasicus.* Sedges: *Bulbostylis barbata.* Herbs: *Trigastrotheca molluginea.*

Vegetation condition	Usually Excellent to Very Good, with only very occasional weeds, and signs of cattle; Good in some areas with ground disturbance; Poor in one area with considerable historical clearing.
Sampling sites	Quadrats MBU27, MBU28, MBU33 and MBU79.



Plate 4.24: Unit H8 (MBU27).



Plate 4.25: Unit H8 (MBU79).

4.2.2.2 Vegetation of Saline and Gravelly Plains

P1	***Acacia bivenosa* scattered tall shrubs over *Senna symonii* scattered shrubs over *Triodia longiceps* hummock grassland.**
Distribution and habitat	This vegetation was restricted to areas of saline plain and adjacent lower slopes associated with the Mosquito land system, extending from 4.5 km north of Nullagine to 14 km south (see Plate 4.26 to Plate 4.29). The substrate comprised a fine sandy loam to clay loam with a layer of fine quartz gravel. The dominant stratum in this unit comprised a hummock grassland to open hummock grassland of *Triodia longiceps*, with associated flora including a variety of species in the Chenopodiaceae family (e.g. *Sclerolaena* and *Maireana* spp.), which are typical of saline substrates. Trees were rare, but included very occasional *Eucalyptus leucophloia* subsp. *leucophloia*, and shrubs were only scattered. This vegetation type is equivalent to the "Stony saline plains of the Mosquito land system" PEC (Priority 3).
Other associated species	Shrubs: *Acacia synchronicia, Corchorus parviflorus, Indigofera monophylla, Maireana melanocoma, Melaleuca eleuterostachya, Pluchea ferdinandi-muelleri, P. tetranthera, Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795). Grasses: *Cynodon prostratus, Dactyloctenium radulans, Sporobolus actinocladus, S. australasicus.* Sedges: *Fimbristylis dichotoma.* Herbs: *Cassytha capillaris, Heliotropium chrysocarpum, Maireana ? eriosphaera, Pluchea rubelliflora, Portulaca oleracea/intraterranea, Ptilotus exaltatus, Sclerolaena cuneata, S. densiflora, S. hostilis, Trianthema triquetrum*.
Vegetation condition	Usually Excellent to Very Good, with disturbance limited to minor signs of grazing; Good in areas that appear to have been subject to historical clearing. (There has been historical clearing and ground disturbance through this vegetation around Nullagine, however given the naturally "open" nature of the vegetation, it was difficult to determine whether areas were undisturbed or should be assigned a lower condition ranking.)
Sampling sites	Quadrats MBU02, MBU31, MBU36, MBU38, MBU42, MBU43 and MBU78.



Plate 4.26: Unit P1 (MBU02).



Plate 4.27: Unit P1 (MBU31).



Plate 4.28: Unit P1 (MBU36).



Plate 4.29: Unit P1 (MBU78).

P2	***Triodia longiceps, (T. wiseana)* hummock grassland.**
Distribution and habitat	This vegetation type occurred on gravelly plains and some low hill slopes through the survey area, particularly in the southern section (Plate 4.30 and Plate 4.31). Similar to P1, the dominant stratum in this unit was a hummock grassland of *Triodia longiceps*, however small amounts of *T. wiseana* were often present, along with occasional *T. brizoides*. Shrubs were again only scattered, however the Chenopodiaceae species associated with P1 were not recorded from this unit.
Other associated species	Shrubs: *Acacia bivenosa, A. synchronicia, Corchorus lasiocarpus* subsp. *lasiocarpus, Senna artemisioides* subsp. *helmsii, S. glutinosa* subsp. x *luerssenii, S. glutinosa* subsp. *pruinosa, S. notabilis, Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795). Grasses: *Aristida contorta, Dichanthium sericeum* subsp. *humilius, Enneapogon caerulescens, E. polyphyllus, Eriachne pulchella, Sporobolus australasicus, Tragus australianus.* Herbs: *Arivela viscosa, Boerhavia coccinea, Euphorbia australis* var. *subtomentosa, E. boophthona, Evolvulus alsinoides* var. *villosicalyx, Gomphrena cunninghamii, Notoleptopus decaisnei, Portulaca oleracea/intraterranea, Ptilotus aervoides, P. auriculifolius, P. exaltatus, Streptoglossa bubakii, Swainsona stenodonta, Tribulus hirsutus, Trichodesma zeylanicum* var. *zeylanicum.*
Vegetation condition	Usually Excellent to Very Good, with disturbance limited to minor historical ground disturbance or scattered weeds; ranked as Good where there was considerable ground disturbance.
Sampling sites	Quadrats MBU69 and MBU70; relevé REL19.



Plate 4.30: Unit P2 (MBU69).



Plate 4.31: Unit P2 (MBU70).

P3	***Triodia epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred on gravelly plains and some low hill slopes through various sections of the survey area (Plate 4.32 and Plate 4.33). The hummock grassland was dominated by the soft spinifex *Triodia epactia* (Humpback Spinifex), with occasional hummocks of *T. longiceps* and sometimes *T. wiseana*. Shrubs were typically only scattered. Although having the same dominant species as H4, the two units were distinguished by species reflecting the differing habitats; particularly *Acacia synchronicia* and the various annual grasses on the plains; and *Acacia eriopoda, A. ptychophylla* and *Corchorus parviflorus* on the hills.
Other associated species	Shrubs: *Acacia inaequilatera, A. synchronicia, Senna glutinosa* subsp. x *luerssenii, Sida echinocarpa.* Grasses: *Aristida contorta, Dactyloctenium radulans, Dichanthium sericeum* subsp. *humilius, Enneapogon caerulescens, Eragrostis cumingii, Iseilema dolichotrichum, Sporobolus australasicus.* Sedges: *Bulbostylis barbata.* Herbs: *Arivela viscosa, Boerhavia burbidgeana, Corchorus tridens, Cucumis variabilis, Euphorbia biconvexa, Evolvulus alsinoides* var. *villosicalyx, Gomphrena cunninghamii, Heliotropium cunninghamii, Indigofera colutea, I. linifolia, I. linnaei, Polygala glaucifolia, Portulaca oleracea/intraterranea, Ptilotus auriculifolius, Sclerolaena cornishiana, Sida fibulifera, Streptoglossa bubakii, Swainsona stenodonta, Tribulus hirsutus.*
Vegetation condition	Usually Excellent to Very Good, with occasional weeds in some areas and minor impacts from cattle; a few areas ranked as Good, with considerable ground disturbance.
Sampling sites	Quadrats MBU15, MBU65 and MBU66.



Plate 4.32: Unit P3 (MBU15).



Plate 4.33: Unit P3 (MBU66).

P4	***Acacia trachycarpa* open shrubland over *Triodia epactia, T. longiceps* hummock grassland.**
Distribution and habitat	This vegetation type typically occurred in low-lying areas on plains through all but the southern third of the survey area (Plate 4.34 and Plate 4.35). The open shrubland was dominated by *Acacia trachycarpa*, often with small amounts of *A. bivenosa* or *A. inaequilatera*. The hummock grassland in this unit was dominated by varying amounts of *Triodia epactia* and *T. longiceps*.
Other associated species	Shrubs: *Corchorus parviflorus, Hibiscus sturtii* var. *campylochlamys, Indigofera monophylla, Pluchea tetranthera, Senna artemisioides* subsp. *helmsii, S. notabilis, Sida* sp. Pilbara (A.A. Mitchell PRP 1543), *Solanum diversiflorum.* Grasses: *Chrysopogon fallax, Dactyloctenium radulans, Eragrostis cumingii, Perotis rara, Sporobolus australasicus.* Sedges: *Bulbostylis barbata, Fimbristylis dichotoma.* Herbs: *Arivela viscosa, Boerhavia burbidgeana, B. coccinea, Evolvulus alsinoides* var. *villosicalyx, Goodenia microptera, Heliotropium cunninghamii, Portulaca oleracea/intraterranea, Rhynchosia minima, Sclerolaena costata, Trianthema triquetrum, Tribulus hirsutus, Trigastrotheca molluginea.*
Vegetation condition	Usually Excellent to Very Good, occasionally Good: weeds (particularly **Cenchrus ciliaris* or **C. setiger*) often present, but typically only as scattered individuals; some patches of more dense **Cenchrus*; grazing impacts from cattle in some areas.
Sampling sites	Quadrats MBU10, MBU12, MBU22, MBU32, MBU34 and MBU47.



Plate 4.34: Unit P4 (MBU10).



Plate 4.35: Unit P4 (MBU34).

P5	***Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Triodia wiseana, (T. longiceps)* open hummock grassland.**
Distribution and habitat	This vegetation type occurred only on a few areas of stony undulating calcrete plain over a 5.5 km stretch from Bonney Downs homestead south, in the southern third of the survey area (Plate 4.36 and Plate 4.37). Some of this area had been recently burnt. Scattered shrubs to an open shrubland of *Acacia bivenosa* was sometimes present. The hummock grassland was dominated by *Triodia wiseana,* with a small amount of *T. longiceps*.

Other associated species	Shrubs: *Abutilon cunninghamii, Capparis umbonata, Corchorus lasiocarpus* subsp. *lasiocarpus, Hibiscus sturtii* var. *campylochlamys, Indigofera monophylla, Pluchea ferdinandi-muelleri, Senna glutinosa* subsp. *glutinosa* x subsp. x *luerssenii, S. notabilis, S. symonii, Sida echinocarpa, Solanum horridum.* Grasses: *Enneapogon polyphyllus, Eragrostis desertorum, Paraneurachne muelleri, Sporobolus australasicus.* Herbs: *Arivela viscosa, Corchorus tridens, Cucumis variabilis, Dysphania sphaerosperma, Euphorbia biconvexa, E. vaccaria* var. *erucoides, Evolvulus alsinoides* var. *villosicalyx, Goodenia microptera, Heliotropium chrysocarpum, H. cunninghamii, Notoleptopus decaisnei, Polygala glaucifolia, Ptilotus axillaris, P. clementii, P. exaltatus, Scaevola amblyanthera* var. *centralis, Sclerolaena cornishiana, Sida fibulifera, Stackhousia muricata* subsp. annual (W.R. Barker 2172), *Streptoglossa bubakii, S. decurrens, Tribulus hirsutus.*
Vegetation condition	Excellent to Very Good: occasional weeds, and minor impacts from cattle and donkeys.
Sampling sites	Quadrats MBU49, MBU50 and MBU58.



Plate 4.36: Unit P5 (MBU49).



Plate 4.37: Unit P5 (MBU50).

4.2.2.3 Vegetation of Cracking Clays

C1	***Triodia longiceps, T. epactia* open hummock grassland with patches of mixed herbland and annual grassland.**
Distribution and habitat	This vegetation was restricted to some minor areas of cracking clay substrate associated with the Wona land system, in the central section of the survey area (see Plate 4.38 to Plate 4.40). The ground layer in this unit comprised a mosaic of patches of hummock grassland dominated by *Triodia longiceps* and *T. epactia*, interspersed with large open patches that were dominated by herblands and annual grasslands of various species but particularly including *Neptunia dimorphantha, Sida fibulifera, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273), *Cynodon convergens* and *Sporobolus australasicus*. The cover of spinifex decreased as the clay content in the substrate increased (see Plate 4.40). Trees were uncommon, and shrubs were only scattered. Numerous species that are characteristic of cracking clay substrates were either only recorded from this vegetation type, or the majority of records were from the three sites. This vegetation type is equivalent to one of the "Four plant assemblages of the Wona land system" PEC (Priority 1).

Other associated species	Shrubs: *Acacia synchronicia, Senna hamersleyensis* x *S.* sp. Karijini (M.E. Trudgen 10392). Grasses: *Aristida latifolia, Chloris pectinata, Dactyloctenium radulans, Dichanthium sericeum* subsp. *humilius, Enneapogon caerulescens, Eriachne mucronata, Paspalidium retiglume*. Herbs: *Abutilon malvifolium, Alysicarpus muelleri, Arivela viscosa, Corchorus tridens, Crotalaria medicaginea* var. *neglecta, Cucumis picrocarpus, Desmodium campylocaulon, D. muelleri, Euphorbia inappendiculata* var. *inappendiculata, E. trigonosperma, Evolvulus alsinoides* var. *villosicalyx, Goodenia muelleriana, Hibiscus brachysiphonius, Indigofera linifolia, I. trita* subsp. *trita, Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479), *Phyllanthus maderaspatensis, Portulaca oleracea/intraterranea, Ptilotus gomphrenoides, Rhynchosia minima, Rostellularia adscendens* var. *clementii, Sclerolaena costata, Swainsona thompsoniana, Streptoglossa liatroides, Trianthema triquetrum*.
Vegetation condition	Very Good: **Cenchrus ciliaris* and **C. setiger* typically present but only as very scattered individuals; minor signs of grazing.
Sampling sites	Quadrats MBU46, MBU52 and MBU55.



Plate 4.38: Unit C1, with open spinifex (MBU52).



Plate 4.39: Unit C1 (MBU46).



Plate 4.40: Unit C1, dominated by grasses and herbs (MBU55).

4.2.2.4 Mulga Vegetation

M1	***Acacia aptaneura* scattered low trees to low woodland over *Triodia longiceps, T. epactia* hummock grassland.**
Distribution and habitat	This vegetation type occurred on clay loam soils on some areas of plains and a few small isolated rocky knolls in the southern third of the survey area (Plate 4.41 and Plate 4.42). The tree overstorey varied in cover and composition with topographic position; the knolls had a sparse overstorey of *Acacia aptaneura* (Slender Mulga) alone, while the plains supported a more dense overstorey that included both *A. aptaneura* and *A. ayersiana* (Broad-leaf Mulga). The hummock grassland stratum was dominated by *Triodia longiceps* and *T. epactia,* with scattered individuals of *T. brizoides* also recorded.
Other associated species	Shrubs: *Abutilon* sp. Pilbara (W.R. Barker 2025), *Acacia tetragonophylla, Maireana georgei, M. planifolia, M. villosa, Senna notabilis*. Grasses: *Aristida contorta, Dactyloctenium radulans, Enneapogon caerulescens, E. polyphyllus, Eriachne mucronata, Sporobolus australasicus.* Herbs: *Amaranthus cuspidifolius, Cucumis variabilis, Duperreya commixta, Ptilotus exaltatus, Trianthema triquetrum, Tribulus hirsutus.*
Vegetation condition	Usually Excellent to Very Good, with only very occasional weeds present, and/or minor signs of grazing; a few areas close to the Marble Bar Road were ranked as Good due to historical ground disturbance. Many areas were recently burnt, however it is expected that these should recover with time.
Sampling sites	Relevés REL20 and REL26; quadrat RH13 from GHD (2016).



Plate 4.41: Unit M1 (REL20).



Plate 4.42: Unit M1 (REL26).

4.2.2.5 Vegetation of Drainage Lines

D1	***Eucalyptus camaldulensis, E. victrix* open forest over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* low open woodland over **Cenchrus* spp. tussock grassland.**
Distribution and habitat	This vegetation was restricted to major drainage lines, from the Nullagine River and Cajuput Creek in the north, through to tributaries of the Fortescue River at the southern end of the survey area (see Plate 4.43 to Plate 4.46). The open forest overstorey included the obligate phreatophyte *Eucalyptus camaldulensis subsp.* refulgens (River Gum). Another obligate phreatophyte, *Melaleuca argentea* (Silver Cadjeput), was recorded only from the vicinity of REL13 in the aptly named Cajuput Creek (Plate 4.44). The ground layer was dominated by introduced grasses, mainly **Cenchrus* species, sometimes together with considerable amounts of **Cynodon dactylon* or **Echinochloa colona*. Pools of water were recorded in some areas, supporting obligate aquatic plants such as *Potamogeton tricarinatus* and the sedge *Schoenoplectus subulatus*.
Other associated species	Shrubs: *Acacia ampliceps*, *A. pyrifolia* var. *pyrifolia, Melaleuca glomerata, *Vachellia farnesiana.* Grasses: *Eragrostis cumingii*. Sedges: *Cyperus vaginatus*. Herbs: *Amaranthus undulatus, Arivela viscosa, Centipeda minima* subsp. *macrocephala, *Citrullus colocynthis, Corchorus tridens, Cucumis variabilis, Ludwigia perennis, *Malvastrum americanum, Phyllanthus maderaspatensis, Pluchea rubelliflora, Pterocaulon sphacelatum, Sesbania cannabina, Stemodia grossa, Vigna lanceolata* var. *lanceolata*.
Vegetation condition	Generally Poor: high cover of **Cenchrus ciliaris* and **C. setiger* typically present, along with scattered other weeds; grazing impacts also noted. Some sections ranked as Very Poor to Very Good, where weed cover was patchy.
Sampling sites	Relevés REL06, REL13, REL15, REL16, REL21.



Plate 4.43: Unit D1 in Nullagine River (REL06).



Plate 4.44: Unit D1 in Cajuput Creek (REL13).



Plate 4.45: Unit D1 in Nullagine River (REL15).

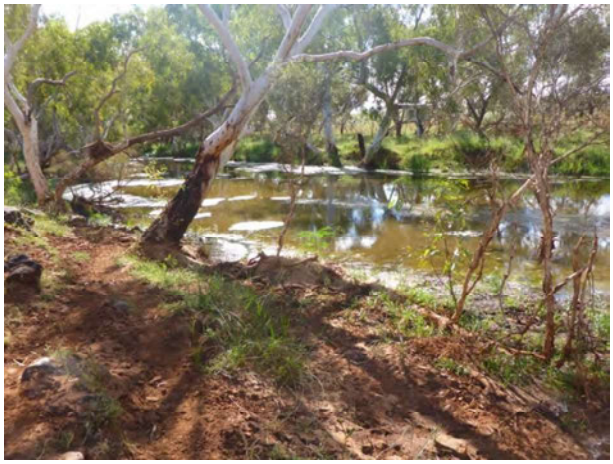


Plate 4.46: Unit D1 in Wild Dog Creek (REL16).

D2	***Eucalyptus victrix, (Acacia coriacea* subsp. *pendens*) low open woodland over *Triodia longiceps* very open hummock grassland.**
Distribution and habitat	This vegetation occurred in moderate to minor drainage lines and on adjacent floodplains, from Taylor Creek north of Nullagine, to tributaries of Christmas Creek and Kulbee Creek in the southern end of the survey area (see Plate 4.47 and Plate 4.48). The open ground layer was typically dominated by *Triodia longiceps* (Giant Grey Spinifex), occasionally together with some *T. epactia*, and usually with only small amounts of introduced **Cenchrus* grasses.
Other associated species	Shrubs: **Aerva javanica, Corchorus parviflorus, Cullen leucanthum, Indigofera monophylla, *Vachellia farnesiana.* Grasses: *Dactyloctenium radulans, *Echinochloa colona, Eragrostis cumingii, E. leptocarpa, Perotis rara.* Sedges: *Cyperus squarrosus*. Herbs: *Alternanthera nana, Amaranthus undulatus, Arivela viscosa, Boerhavia burbidgeana, B. coccinea, Cucumis variabilis, Gomphrena cunninghamii, Indigofera linifolia, I. linnaei, Ipomoea racemigera, *Malvastrum americanum, Phyllanthus maderaspatensis, Pluchea rubelliflora, Stemodia grossa*.
Vegetation condition	Usually Very Good to Good; weeds typically present but usually only at relatively low densities; grazing noted in some areas. One area ranked as Poor, with higher weed cover.
Sampling sites	Quadrats MBU30 and MBU62; relevé REL22.



Plate 4.47: Unit D2 in Taylor Creek (MBU30).



Plate 4.48: Unit D2 on floodplain of tributary of Christmas Creek (MBU62).

D3	***Eucalyptus victrix, (Acacia coriacea* subsp. *pendens*) low woodland over *Acacia trachycarpa* open shrubland over *Eriachne benthamii* open tussock grassland with *Triodia longiceps* very open hummock grassland.**
Distribution and habitat	This vegetation occurred in moderate to minor drainage lines in the northernmost 23 km section of the survey area, occurring in Spinaway Creek and in tributaries of the Nullagine River (see Plate 4.49 and Plate 4.50). The open ground layer was typically dominated by the native tussock grass *Eriachne benthamii* (Swamp Wanderrie), usually with a lesser amount of the spinifex *Triodia longiceps*, and typically with only small amounts of introduced **Cenchrus* grasses.
Other associated species	Shrubs: *Acacia pyrifolia* var. *pyrifolia, Corchorus parviflorus.* Grasses: *Chrysopogon fallax, Dactyloctenium radulans, *Echinochloa colona, Eragrostis cumingii, Eulalia aurea.* Sedges: *Cyperus ixiocarpus*. Herbs: *Amaranthus undulatus, Arivela viscosa, Euphorbia trigonosperma, Hybanthus aurantiacus, Ipomoea muelleri, Marsilea hirsuta, Phyllanthus maderaspatensis, Pluchea dentex, P. rubelliflora, Polymeria ambigua, Stemodia grossa*.
Vegetation condition	Very Good to Good: weeds typically present but usually only at relatively low densities; signs of grazing noted in most areas.
Sampling sites	Quadrat MBU18; relevés MBU-REL04, MBU-REL05 and MBU-REL08.



Plate 4.49: Unit D3 (REL08).



Plate 4.50: Unit D3 in Spinaway Creek (REL04).

D4	***Eucalyptus victrix, (Acacia coriacea* subsp. *pendens)* woodland over **Cenchrus ciliaris, *C. setiger, (Eriachne tenuiculmis, Chrysopogon fallax)* tussock grassland with *Cyperus vaginatus* scattered sedges.**
Distribution and habitat	This vegetation occurred in moderate drainage lines throughout the survey area except at the northernmost end, including in sections of the Nullagine River and its tributaries, in Daylight Creek, Wild Dog Creek, Christmas Creek and Kulbee Creek at the southern end (see Plate 4.51 and Plate 4.52). The overstorey ranged from a low open woodland to an open forest, and was dominated by *Eucalyptus victrix* with lesser amounts of *Acacia coriacea* subsp. *pendens*, and usually a small amount of *Atalaya hemiglauca*. Patches of *Melaleuca glomerata* tall shrubland, often with *M. linophylla*, were recorded in some creeks. The ground cover ranged from an open to closed tussock grassland but was always dominated by **Cenchrus* grasses. The spinifex *Triodia longiceps* was usually also present, but only occurred as scattered individuals. There was often a fringing shrubland of *Acacia ancistrocarpa* with scattered low trees of *Corymbia hamersleyana* around the edges of this unit.

Other associated species	Shrubs: *Acacia pyrifolia* var. *pyrifolia, Corchorus parviflorus, *Vachellia farnesiana.* Grasses: *Dactyloctenium radulans, Eragrostis cumingii, Sporobolus australasicus.* Sedges: *Cyperus squarrosus*. Herbs: *Alysicarpus muelleri, Amaranthus undulatus, Arivela viscosa, Boerhavia coccinea, *Citrullus colocynthis, Cucumis variabilis, Euphorbia australis* var. *subtomentosa, Notoleptopus decaisnei, Phyllanthus maderaspatensis, Rhynchosia minima, Sesbania cannabina, Stemodia grossa*.
Vegetation condition	Usually Poor to Very Poor, occasionally Good: **Cenchrus ciliaris* and **C. setiger* typically abundant, with other weeds also recorded in lower numbers; grazing impacts noted in most areas.
Sampling sites	Quadrats MBU51 and MBU54; relevés REL01, REL02, REL09, REL12, REL14, REL17, REL18, REL23, REL25, REL27 and REL31.



Plate 4.51: Unit D4 in the Nullagine River (REL25).



Plate 4.52: Unit D4 (REL09).

D5	***Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis*, (*A. trachycarpa*) tall open scrub over *Themeda triandra, Chrysopogon fallax* open tussock grassland with *Triodia epactia, (T. longiceps)* very open hummock grassland.**
Distribution and habitat	This vegetation occurred in minor drainage lines north of Nullagine, including in tributaries of Spinaway Creek and the Nullagine River (see Plate 4.53 and Plate 4.54). The sparse tree overstorey was dominated by *Corymbia hamersleyana* (Hamersley Bloodwood), occasionally with *Eucalyptus leucophloia* subsp. *leucophloia* (Snappy Gum). The most prominent stratum was a tall open shrubland to open scrub dominated by *Acacia tumida* var. *pilbarensis* (Pindan Wattle), usually with lesser amounts of *A. trachycarpa* (Minni Ritchi). The ground cover was dominated by native tussock grasses, particularly *Chrysopogon fallax* (Golden Beard Grass) and *Themeda triandra* (Kangaroo Grass), with only scattered individuals of **Cenchrus ciliaris* and **C. setiger*. Small amounts of spinifex were also present, typically dominated by *Triodia epactia* with lesser amounts of *T. longiceps*.
Other associated species	Shrubs: *Acacia trachycarpa* x *A. tumida* var. *pilbarensis, Corchorus parviflorus, Grevillea wickhamii* subsp. *hispidula, Hibiscus sturtii* var. *campylochlamys, Indigofera monophylla, Solanum diversiflorum.* Grasses: *Aristida contorta, Cymbopogon ambiguus, Eragrostis cumingii, Paraneurachne muelleri, Paspalidium rarum, Sporobolus australasicus.* Herbs: *Evolvulus alsinoides* var. *decumbens, E. alsinoides* var. *villosicalyx, Goodenia microptera, Trigastrotheca molluginea*.
Vegetation condition	Very Good to Good: some weeds present, but usually not in high numbers; minor grazing impacts.

Sampling sites	Quadrat MBU35; relevé REL07.



Plate 4.53: Unit D5 (MBU35).



Plate 4.54: Unit D5 (REL07).

D6	***Eucalyptus xerothermica* scattered low trees over *Grevillea wickhamii, Acacia ancistrocarpa, A. bivenosa* tall shrubland over **Cenchrus ciliaris, *C. setiger* open tussock grassland.**
Distribution and habitat	This vegetation occurred in minor drainage lines in the southernmost 22 km section of the survey area, including tributaries of Christmas Creek, the Fortescue River and Kulbee Creek. It was sampled and described as unit "VA01" by GHD (2016) (Plate 4.55 and Plate 4.56). The smallest scale flowlines had *Corymbia hamersleyana* as the dominant tree.
Other associated species	Shrubs: *Acacia pyrifolia, Androcalva luteiflora, Atalaya hemiglauca, Corchorus parviflorus, Hakea lorea* subsp. *lorea, Indigofera monophylla.* Grasses: *Cymbopogon ambiguus.* Herbs: *Arivela viscosa, Duperreya commixta, Dysphania rhadinostachya*.
Vegetation condition	Good to Poor: moderate to dense cover of weeds present.
Sampling sites	Quadrats RH01, RH04, RH06 and RH08 (GHD 2016).



Plate 4.55: Unit D6 (RH01; from GHD 2016).



Plate 4.56: Unit D6 (RH04; from GHD 2016).

D7	***Eucalyptus leucophloia* subsp. *leucophloia, (E. xerothermica)* low open woodland over *Acacia colei, Acacia ancistrocarpa, A. bivenosa* tall shrubland over *Triodia longiceps* open hummock grassland.**
Distribution and habitat	This vegetation occurred in minor drainage lines in the southern section of the survey area, associated with tributaries of Christmas Creek. It was sampled and described as unit "VA08" by GHD (2016) (Plate 4.57).
Other associated species	Shrubs: *Acacia pyrifolia, Grevillea wickhamii, Gastrolobium grandiflorum, Hakea lorea* subsp. *lorea, *Vachellia farnesiana.* Grasses: *Cymbopogon ambiguus.* Herbs: *Duperreya commixta, Ptilotus exaltatus*.
Vegetation condition	Very Good: occasional weeds.
Sampling sites	Quadrats RH16 and RH17 (GHD 2016).

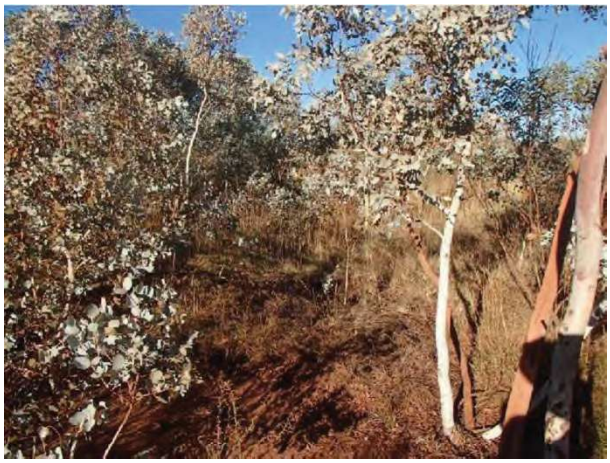


Plate 4.57: Unit D7 (RH16; from GHD 2016).

D8	***Cenchrus ciliaris, *C. setiger* tussock grassland.**
Distribution and habitat	This vegetation type occurred on the broad floodplains and island areas associated with the section of the Nullagine River at the Nullagine townsite (Plate 4.58 and Plate 4.59). The cover of grasses varied from a closed tussock grassland in shaded areas closer to the river, to an open tussock grassland on broad islands. Native trees and shrubs were generally only scattered, but formed a tall open shrubland in some areas.
Other associated species	Shrubs: *Acacia coriacea* subsp. *pendens, A. pyrifolia, A. sclerosperma, A. trachycarpa, *Aerva javanica, Atalaya hemiglauca, Grevillea pyramidalis* subsp. *leucadendron, *Vachellia farnesiana.* Herbs: *Portulaca oleracea/intraterranea*.
Vegetation condition	Very Poor; moderate to dense cover of *Cenchrus* species, with several other weeds also recorded; grazing evident.
Sampling sites	Nil; not considered warranted, given condition of vegetation.




Plate 4.58: Unit D8 on broad island in Nullagine River.



Plate 4.59: Unit D8 on floodplain of Nullagine River.

4.2.3 Results of the Floristic Analysis

At a 25% level of similarity the sites were divided into seven groups (Table 4.8; Table 2 and Figures 1 to 4 in Appendix 15). These showed clear associations with particular habitat types, and could be broadly discriminated on the basis of the abundance of various spinifex (*Triodia*) species:

- *FG*$_a$ contained all sites from units D1-D4, comprising the woodlands of major drainage lines. These were characterised by riparian tree species such as Coolibah (*Eucalyptus victrix*), Wirewood (*Acacia coriacea* subsp. *pendens*) and Whitewood (*Atalaya hemiglauca*) over a variable understorey of shrubs and grasses. Spinifex was not abundant, but small amounts of *Triodia longiceps* (Giant Grey Spinifex) were recorded from most sites. Quadrat MBU47 from P4 on a gravelly plain also clustered in this unit, likely due to the abundance of **Cenchrus* at this site.
- *FG*$_b$ contained all sites from unit H8 on hills; these sites were characterised by a hummock grassland dominated by *Triodia brizoides* (Nodding Spinifex).
- *FG*$_c$ contained all sites from unit C1, comprising vegetation of clay plains. These sites had a variable cover of *Triodia longiceps* and *T. epactia* (Humpback Spinifex), and included a distinct suite of species that are restricted to such habitats (e.g. *Neptunia dimorphantha*).
- *FG*$_d$ contained all sites from the M1, P1 and P2 units, which were characterised by hummock grasslands dominated by *Triodia longiceps*. P1 and P2 were recorded from saline plains and gravelly plains respectively, while the M1 sites were located on a low stony footslope and a rocky knoll.
- *FG*$_e$ contained all sites from the hills vegetation types H1, H2 and H7 and all sites from P5 on gravelly plains. These sites were dominated by *Triodia wiseana* (Limestone Spinifex).

- *FG_f* contained all sites from the hills vegetation types H3-H6, and all sites from P3 and one site from P4 on gravelly plains. These sites were characterised by a hummock grassland dominated by *Triodia epactia*.
- *FG_f* contained both sites from the minor drainage vegetation unit D5, as well as four of the six sites in the gravelly plains vegetation type P4. These sites were characterised by a mix of *Triodia epactia* and *T. longiceps* at ground level, together with small amounts of the shrub *Acacia trachycarpa*. These species are indicative of more mesic habitats than those in *FG_f*.

Table 4.8: Floristic groups at the 25% level of similarity.

Floristic Group	Top 5 Species Contributing to Similarity (cumulative %)	Vegetation Types
a	**Cenchrus* spp., *Eucalyptus victrix, Acacia coriacea, Atalaya hemiglauca, Triodia longiceps* (57%)	D1, D2, D3, D4, P4 (1 site)
b	*Triodia brizoides, T. wiseana, Acacia aphanoclada, T. longiceps, A. bivenosa* (87%)	H8
c	*Triodia epactia, T. longiceps, Neptunia dimorphantha, *Cenchrus* spp., *Arivela viscosa* (32%)	C1
d	*Triodia longiceps, Sporobolus australasicus, Trianthema triquetrum, Acacia bivenosa, Ptilotus exaltatus* (85%)	M1, P1, P2
e	*Triodia wiseana, Sporobolus australasicus, Arivela viscosa, Acacia inaequilatera, Polygala glaucifolia* (64%)	H1, H2, H7 and P5
f	*Triodia epactia, Acacia inaequilatera, Corchorus parviflorus, Bonamia pilbarensis, Indigofera monophylla* (77%)	H3, H4, H5, H6, P3, P4 (1 site)
g	*Triodia epactia, T. longiceps, Acacia trachycarpa, Corchorus parviflorus, Eragrostis cumingii* (42%)	D5, P4 (4 sites)

There was some relatively good correlation between the vegetation types defined for the current survey and the 31 floristic groups identified through the SIMPROF test, although the relationship was not always exact. In particular, there was strong support for the vegetation types C1, H3, H4, H5, H7, H8, P1, P2, P5 and M1, with all sites from these units occurring in distinct floristic groups (Table 3, Figure 2 and Figure 3 in Appendix 15). With regards to the other units, which were split across more than one floristic group, the species driving these differences were typically relatively minor (see Table 3 in Appendix 15).

4.2.4 Vegetation Condition

The condition of the majority (70.9%)of the vegetation in the survey area ranged from Excellent to Very Good. Mapping of vegetation condition is provided in Appendix 12, while a summary of the extent of each vegetation condition category within the survey area is provided in Table 4.9.

Table 4.9: Extent of vegetation condition categories within the survey area.

	Survey Area	
Condition Rating	**Area (ha)**	**Proportion (%)**
Excellent	435.1	18.8
Excellent to Very Good	677.7	29.2
Very Good	531.8	22.9
Good	82.5	3.6
Good to Poor	19.3	0.8
Poor	106.1	4.6
Very Poor to Very Good	0.6	0.03
Very Poor	34.8	1.5
Cleared	431.9	18.6
Total	**2,319.8**	**100.0**

The survey area contained various cleared or disturbed areas associated with the Marble Bar Road, materials sourcing pits, fibre-optic cable lines, current and historical mining exploration tracks and drill pads, and pastoral fences, tracks and other infrastructure. Weeds were typically scattered along the verges of much of the road, however dense infestations were mainly confined to drainage lines and associated floodplains. Evidence of cattle and horses/donkeys was recorded from many sites, however heavy grazing was only noted near pastoral homesteads, at Nullagine, and along major drainage lines.

Much of the southern end of the survey area and contextual area had been burnt very recently or in the last few years (Plate 5.60). As most vegetation in the locality is well adapted to fire and would be expected to regenerate well, fire effects have not been considered as part of the assessment of vegetation condition.



Plate 4.60: Burnt sections of the survey area.

4.2.5 Vegetation of Significance

None of the vegetation types recorded are equivalent to any listed TECs.

Two PECs were recorded in the survey area:

- The "**Stony saline plains of the Mosquito land system**" PEC (Priority 3) is described by DBCA (2020a) as "*Triodia longiceps* perennial grasslands with scattered *Maireana melanocoma* and *Sclerolaena* spp. and includes the Priority 1 flora taxa *Atriplex spinulosa* and *Ptilotus wilsonii* dissected by drainage lines. Dominated by (but not limited to) *Melaleuca eleuterostachya* and *Acacia bivenosa* occurring on saline red brown non-cracking clays with a mantle of quartz gravel and neutral subsurface soil material on level to undulating plains. Largely restricted to an area east of Nullagine." Threatening factors for this community are listed as "preferential grazing (livestock and feral herbivores), clearing for mining and associated activity" (DBCA 2020a).

  Vegetation type P1 mapped for the current study is equivalent to this PEC (Plate 4.61), and was recorded mainly in association with the Mosquito land system around Nullagine (see Appendix 11, vegetation maps 3, 4 and 5). A total of 130.8 ha was mapped in the survey area, which represented 21.6% of the extent in the local area (the survey area and contextual area combined).

- As the name suggests, the "**Four plant assemblages of the Wona land system**" PEC includes four distinct communities. One of these, the "Cracking clays of the Chichester and Mungaroona Range" (Priority 1) assemblage, appears to correspond to the grassland/herbland areas of vegetation type C1 mapped in the survey area (Plate 4.62). DBCA (2020a) describes this assemblage as follows: "This shrubless plain of stony gibber community occurs on the tablelands with very little vegetative cover during the dry season, however during the wet a suite of ephemerals/annuals and short-lived perennials emerge, many of which are poorly known and range-end taxa".

Vegetation type C1 was mapped over 44.3 ha in the central section of the survey area (Appendix 11, vegetation maps 5 and 6). This comprised 17.3% of the mapped extent in the local area.



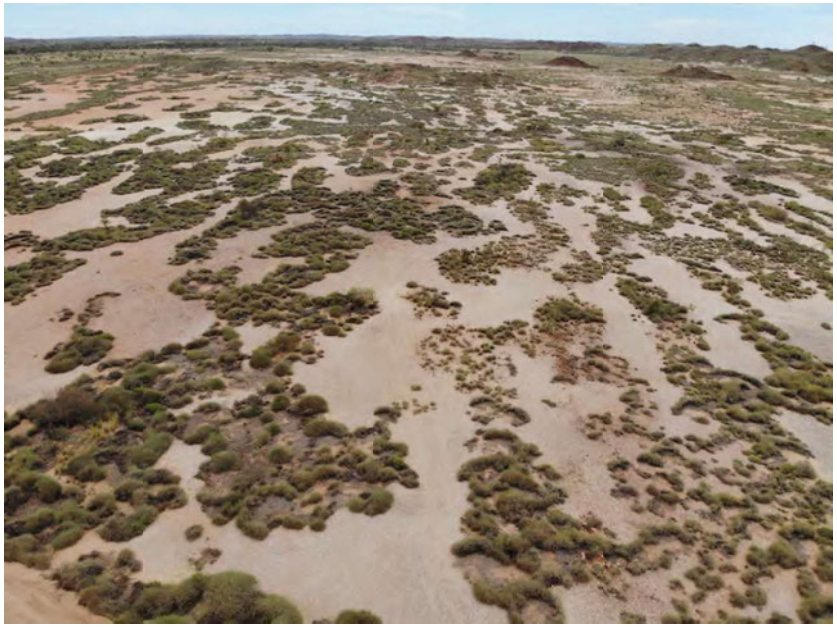
MBU31



MBU43



MBU78



Aerial view

Plate 4.61: Representative photographs of the "Stony saline plains of the Mosquito land system" PEC.



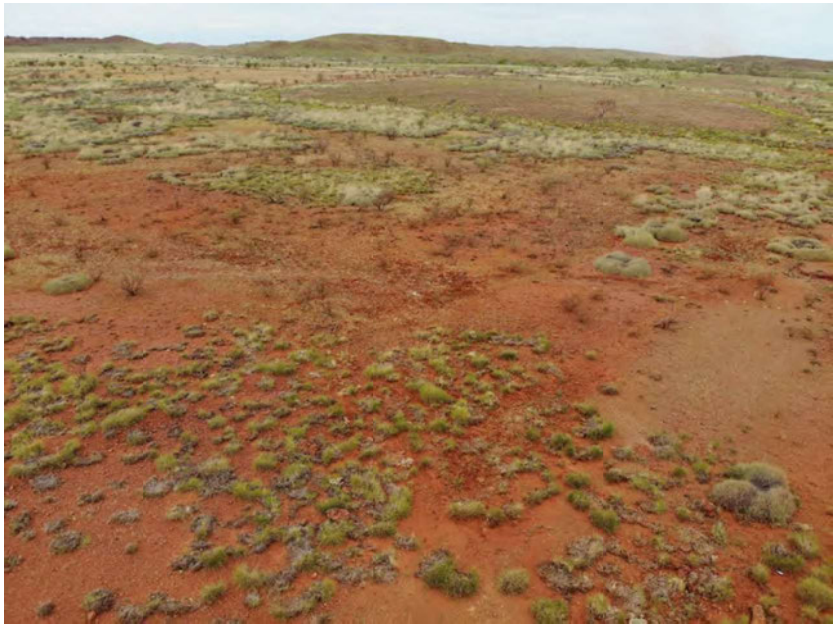
MBU55



MBU46



MBU52



Aerial view

Plate 4.62: Representative photographs of the "Four plant assemblages of the Wona land system" PEC.

4.3 Flora Results

4.3.1 Overview

4.3.1.1 Flora Taxa Recorded from the Survey Area

A total of 466 native vascular flora species from 166 genera and 55 families were recorded from the survey area, along with the alga *Chara* sp. (Appendix 14). The dominant native plant families and genera recorded from the survey area are presented in Table 4.10. These families and genera are typically represented in species lists from this region. Site data, including species recorded from all quadrats and relevés, are presented in Appendix 10.

In addition to the above, 25 introduced flora species (weeds) from 24 genera and 13 families were recorded from the survey area, while one additional weed species was recorded in the contextual area (see Section 4.3.3).

Table 4.10: Dominant families and genera recorded from the survey area.

Family	No. of Native Species	Genus	No. of Native Species
Fabaceae (wattles, peas, cassias)	93	*Acacia* (wattles)	35
Poaceae (grasses)	69	*Ptilotus* (mulla-mullas)	15
Malvaceae (lantern-flowers, hibiscus, etc)	44	*Senna* (cassias)	14
Amaranthaceae (mulla-mullas, joyweeds, amaranths, etc)	27	*Eragrostis* (lovegrasses)	11
Cyperaceae (sedges)	24	*Euphorbia* (spurges)	11
Chenopodiaceae (saltbush, bluebush, etc)	22	*Heliotropium* (heliotropes)	11

4.3.1.2 Unresolved Taxa

Most of the specimens collected (94%) were able to be resolved to the lowest level possible within the current taxonomic framework. The remaining comprised those specimens for which insufficient material was present to confirm the species, and a number of presumed hybrid *Senna* taxa, for which the parentage was not clear. With the exception of a single specimen identified as "*Themeda* ? sp. Hamersley Station (M.E. Trudgen 11431)" (Priority 3), none of these are considered to represent taxa of significance.

4.3.1.3 Sampling Adequacy

The species accumulation curve generated from the quadrat and relevé survey data is approaching a plateau, indicating that the sampling of the survey area was relatively thorough (Figure 6.1). However, the two estimates of species richness (ICE and Chao2) suggested that the actual number of species present in the sampled area was approximately 562, which would mean that 81% of the total flora (native and introduced species) was recorded during the site sampling for the current study (see Table 6.2). This proportion is similar to those reported for other surveys of a similar nature (e.g. 83% (Ecoedge 2014); 84% (Ecologia 2016), 82-88% (Ecologia 2009); 86-87% (Biota 2018); and 87% (Coffey 2015)). It should be noted that an additional 33 taxa were recorded through the opportunistic sampling within the survey area; with inclusion of these taxa, the 2020 survey work has recorded 87% of the predicted total number of taxa.

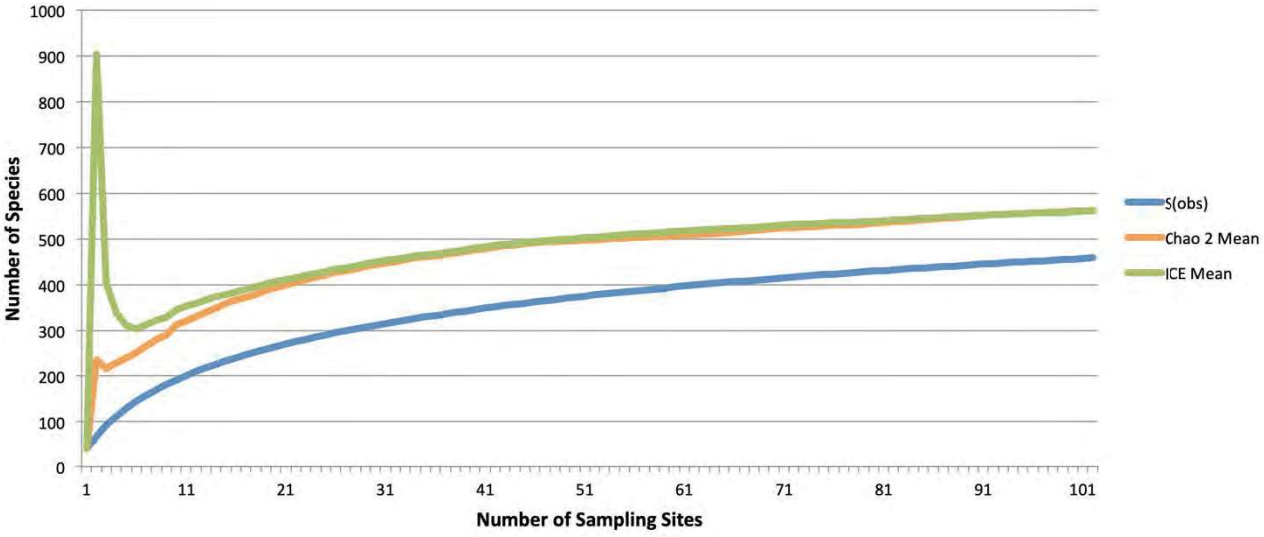


Figure 4.8 Randomised species accumulation curves for sites sampled in the survey area.

Table 4.11: Recorded species richness compared with predicted species richness using incidence-based estimators (without opportunistic records).

Parameter		Number of Species	Percent of Estimated Richness Recorded
Number of species recorded (from quadrats and relevés only)		458	
Estimated number of species	Chao 2 Mean	563	81%
	ICE Mean	562	81%

4.3.1.4 Species Richness

Species richness typically shows a positive relationship with various factors, including the size of the study area, the diversity of habitats present, the amount of rainfall received by the locality, and the survey effort expended. The total number of native species recorded by the current study is shown in Figure 6.2, compared to various other survey areas in the locality: the Roy Hill North Realignment (GHD 2016), The Gap / Fortescue River Bridge (Astron 2014), Beatons Creek (Woodgis 2019), Nullagine Iron Ore Project (Plantecology Consulting 2013), and the Chichester and Hamersley Extensions to the Hope Downs Rail Corridor (Biota 2004b, 2004c). The number of species recorded from the current survey area was proportionally higher than for the other survey areas, which is considered to reflect a variety of factors:

- the narrow linear shape of the survey area crossed a variety of landforms, land systems and geological types, meaning that a diverse array of habitats was intersected;
- the length of the corridor (over 80 km) crossed a broad geographic range, providing the opportunity to intersect the ranges of a greater number of species; and
- very high rainfall was received in January 2020, resulting in optimal collecting conditions for most of the survey area.

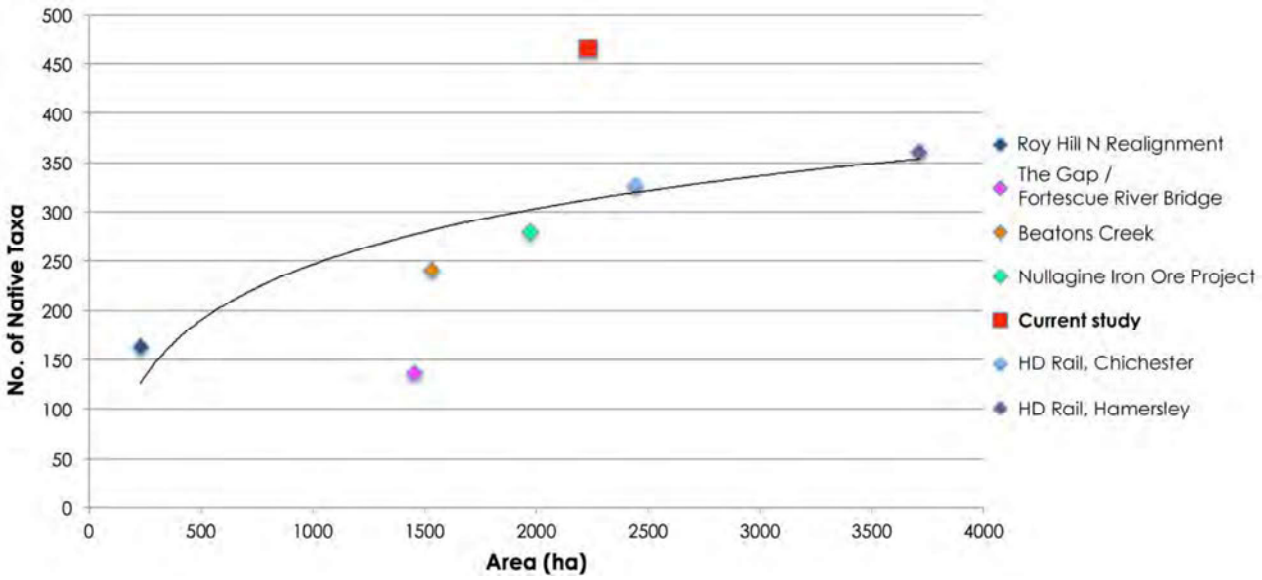


Figure 4.9: Species richness for the current survey area, compared to other survey areas in the locality.

4.3.2 Significant Flora

4.3.2.1 Threatened Flora

No species listed as Threatened flora under either State or Commonwealth legislation have been recorded in the survey area to date, and none would be expected to occur (see Appendix 3).

4.3.2.2 Priority Flora

A total of 13 Priority species were recorded during the field survey, comprising:

- three Priority 1 species: *Acacia aphanoclada, A. cyperophylla* var. *omearana*, and *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795).
- three Priority 2 species: *Euphorbia inappendiculata* var. *inappendiculata, Ipomoea racemigera* and *Paspalidium retiglume*;
- six Priority 3 species: *Eragrostis crateriformis, Nicotiana umbratica, Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479), *Rhagodia* sp. Hamersley (M. Trudgen 17794), *Swainsona thompsoniana* and *Themeda* sp. Hamersley Station (M.E. Trudgen 11431); and
- one Priority 4 species: *Goodenia nuda*.

An additional Priority 1 species, *Atriplex spinulosa*, has been recorded previously in the survey area at the Nullagine townsite. Although it was not found during the current survey, it is still considered likely to occur.

Two other Priority 3 species may occur in the survey area:

- The small annual daisy *Iotasperma sessilifolium* is restricted to clay substrates. The vegetation type C1 would be potentially suitable for this species, although the closest record to these is approximately 18 km southwest. This daisy typically germinates and flowers later in the year (i.e. (May)August-September), so would not have been visible during the field survey, if present.
- *Rostellularia adscendens* var. *latifolia* is known from one record in the locality and has broad habitat preferences (stony plains, hills, creeklines etc). While it was not recorded during the field survey, it is an inconspicuous herb, and there is an abundance of suitable habitat.

Based on post-survey likelihood of occurrence assessment, no other Priority flora species are considered to be likely to occur in the survey area (Appendix 3).

Locations of Priority flora recorded during this survey are presented and mapped in Appendix 13, along with historical records identified through the desktop study (where data were provided). This

appendix also includes Threatened and Priority Flora Report Forms for each species, which have been submitted to DBCA.

Each species recorded is described briefly below.

***Acacia aphanoclada* (Priority 1)**
This tall spindly shrub (Plate 4.63) has a relatively restricted distribution, with known records distributed over a range of 66 km east-west and 40 km north-south (DBCA 2020b). During the current survey, this species was found to be locally common from approximately 8.7 km north to 10.5 km south of Nullagine, occurring as scattered individuals across low stony hills and plains. It was found in vegetation types D1, H2, H3, H4, H5, H6, H8, P1, P4 and along the edges of some cleared areas. Most records were associated with the Mosquito land system, although the northernmost records were in the Capricorn land system, and some records towards the southern end of the recorded locations were in the Rocklea land system. A total of 2,865 individuals were recorded from 891 locations in the main survey area, with a further 25 individuals recorded from 20 locations along the Nullagine Bypass. A total of 784 additional individuals were recorded from 40 locations in the contextual area. In total these represented 29 populations, based on the separation distance of 500 m as specified by Stack (2017). Five of these were considered to be known populations, as they included the locations of historical voucher specimens lodged with the WA Herbarium, while 24 populations were newly documented for the area.

Given that there is extensive suitable habitat in the vicinity, the species would be expected to occur at similar densities in the surrounding areas. This assessment is supported by Woodgis (2019): that study similarly recorded a total of 4,713 plants in the vicinity of Nullagine from an area of approximately 70 ha, and the species was described as "locally widespread/abundant". Some of these populations overlapped the current survey area, while others extended into the contextual area and further west into the study area. No location data were provided in Woodgis (2019), so it was not possible to include these records on the mapping in Appendix 13, or to determine the total population size in the local area.



Plate 4.63: ***Acacia aphanoclada*.**

***Acacia cyperophylla* var. *omearana* (Priority 1)**
A single tree of *Acacia cyperophylla* var. *omearana* was recorded from the southern bank of the Nullagine River, in the Nullagine Bypass survey area in vegetation type D1. (Note that a WA Herbarium voucher specimen that was reportedly collected within the survey area is considered to be incorrectly located, as the coordinates do not match the described location, which should be 2 km east of Nullagine.)

The broader distribution of this species extends 130 km northwest to Limestone Station, north of Marble Bar (DBCA 2020b). *Acacia cyperophylla* var. *omearana* is well documented from Beaton's Creek, approximately 1.6 km west of Nullagine: Woodgis (2019) reported that this species was continuous over a 1 km stretch, and may be largely continuous over the broader 12 km length of this creek, but did not report numbers of individuals. This location is upstream of the single individual in the Nullagine Bypass.



Plate 4.64: ***Acacia cyperophylla* var. *omearana* on bank of Nullagine River.**

***Atriplex spinulosa* (Priority 1)**

This species extends over a range of 930 km, from 60 km east of Nullagine, west to near Carnarvon, and south to inland of Geraldton (DBCA 2020b). It had been recorded prior to 2000 in the vicinity of Nullagine, including two records in the townsite itself, which plot within the survey area. It was also apparently recorded more recently within the survey area, 1.5 km northeast of Nullagine (see Figure 20 in WoodGIS 2019); no location coordinates or numbers of individuals were provided for these records in WoodGIS (2019), so the location shown in Appendix 13 is approximate only. It appears that no voucher specimens were lodged from the latter study.

Atriplex spinulosa was not recorded during the current survey, and no specimens belonging to this genus were unidentifiable. Some locations within the Nullagine townsite were not able to be accessed (located on private property), but it is also possible that this herb was not evident at the time of the survey. Given the lack of records from the 2020 survey, this species is unlikely to be abundant in the area, even if present. The most likely vegetation types in which it would be expected to be recorded would be P1 and P2.

***Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) (Priority 1)**

Prior to the current survey, this species had been documented from numerous locations around Nullagine in the Mosquito land system (see Figure 22 in WoodGIS 2019), including some records in the current survey area: a stand of several records 1.7 km north of the town, and two locations within 1.8 km south of the town. This species was recorded at the same locations within the survey area during the current survey within vegetation types P1 and P2, albeit at lower numbers, possibly due to maturing of the vegetation; the vegetation from which this species was recorded in 2020 was relatively mature (see Plate 4.65). WoodGIS (2019) described densities being considerably higher in recently burnt areas (6,533 plants per ha, compared to up to 156 plants per ha in unburnt sites). The species had also apparently been recorded approximately 12 km S of Nullagine, although the exact location is uncertain.

In 2020, *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) was also recorded from another two locations in the survey area some distance to the south (49 km and 60.5 km south of Nullagine, mapped as the Bonney and McKay land systems respectively); these latter records expand the southern boundary of the distribution of this taxon. In total, 44 individuals were recorded from 15 locations in the survey area, distributed from 1.8 km north to 60.5 km south of Nullagine. With the addition of the southern records, this taxon now has a known distribution spanning 48 km east-west and 62 km north-south (DBCA 2020b).



Plate 4.65: *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) from north of Nullagine.

***Euphorbia inappendiculata* var. *inappendiculata* (Priority 2)**
This small annual herb was recorded as scattered individuals in two quadrats (MBU46 and MBU55) in the centre of the survey area, 20 km and 22.1 km south of Nullagine. Both quadrats were located in areas of cracking clay (vegetation type C1), which is the preferred habitat of this species. In WA, *Euphorbia inappendiculata* var. *inappendiculata* is distributed across a range of almost 500 km; most records are from the Pilbara, with one record from the adjacent Gascoyne bioregion (WA Herbarium 2020). The records from the survey area extend the eastern edge of this distribution by approximately 70 km. It should be noted that the Atlas of Living Australia (ALA 2021) also shows a single collection in the Northern Territory Herbarium from near the WA border, over 900 km east of the Pilbara records.

***Ipomoea racemigera* (Priority 2)**
This annual creeper was recorded from three quadrats (MBU30, MBU51 and MBU62) and two opportunistic collections, with the locations extending from 10 km north to 55 km south of Nullagine. All of the records were from creeklines (vegetation types D2 and D4), which comprise the preferred habitat of this species. In WA, *Ipomoea racemigera* is distributed over a range of 360 km across the Pilbara, with an outlying record approximately 1,300 km northeast, from north of Kununurra (DBCA 2020b). The records from the current survey are now the furthest northeast within the Pilbara. ALA (2021) shows this species spanning a total distance of some 3,200 km, extending through the Northern Territory into northeast South Australia and through Queensland almost to the east coast, however the Pilbara populations are disjunct.

***Paspalidium retiglume* (Priority 2)**
This annual grass was recorded as scattered individuals in one quadrat (MBU55) in the centre of the survey area, 20 km south of Nullagine. This location comprises an area of cracking clay (vegetation type C1), which is typical habitat for this species. *Paspalidium retiglume* is infrequently recorded in the Pilbara; the existing records were distributed over a range of 240 km east-west (DBCA 2020b), with the current record increasing the known range of this species another 120 km further east. The Pilbara populations are disjunct from the broader distribution of this species, which extends over a range of 2,000 km from the eastern Kimberley through to eastern Queensland (ALA 2021).

***Eragrostis crateriformis* (Priority 3)**
This annual grass was recorded from a creekline at the northern end of the survey area in 2013 (vegetation type D5). It was not found at this location during the current survey, but was recorded as scattered individuals from four quadrats (MBU30, MBU32, MBU54 and MBU51), one relevé (MBU-REL02) and an opportunistic collection, all in either creeklines or associated floodplains (vegetation types D2, D4 and P4). This species has a range of 2,000 km, extending from Yanrey Station near Onslow to the inland Northern Territory, with most records being from the Pilbara bioregion (ALA 2021).

***Nicotiana umbratica* (Priority 3)**
A total of seven individuals were recorded from two locations 11.7 km and 48 km S of Nullagine. All were growing in sheltered microhabitats at the base of boulders in vegetation type H6. On the

basis of the existing records, *Nicotiana umbratica* is distributed over a range of 460 km east-west through the Pilbara (DBCA 2020b); the current records represent a minor extension of another 20 km to the east.



Plate 4.66: ***Nicotiana umbratica;*** **habitat and flowering stems.**

Oldenlandia **sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3)**
This small annual herb was recorded from three quadrats (MBU46, MBU55 and MBU66) between 19.9 km and 53 km south of Nullagine; the two northern records were from areas of vegetation type C1 on cracking clay, which is typical habitat for this species, while the southern record was from an area of clay within vegetation type P3. This species is distributed over a broad range of 400 km through the Pilbara, but is restricted to heavy clay soils (WA Herbarium 2020). The current records are at the eastern edge of the known range.



Plate 4.67: ***Oldenlandia*** **sp. Hamersley Station (A.A. Mitchell PRP 1479) (photos not from survey area).**

Rhagodia **sp. Hamersley (M. Trudgen 17794) (Priority 3)**
This species was recorded at two locations in the survey area by GHD (2016), 58-59 km south of Nullagine. During the current survey, no individuals were found at the northern location, which had been recently burnt, however four individuals were recorded in the vicinity of the southern record of GHD (2016). Another individual was recorded 3.4 km further south (extending the southern edge of the known records to 62 km south of Nullagine). These records were located in vegetation types H7 and P2; all were associated with areas of open Mulga vegetation on plains with a clayey substrate, which is typical habitat for this taxon. *Rhagodia* sp. Hamersley (M. Trudgen 17794) is distributed over a range of 290 km through the Pilbara (DBCA 2020b).





Plate 4.68: ***Rhagodia*** **sp. Hamersley (M. Trudgen 17794).**

Swainsona thompsoniana **(Priority 3)**
This annual herb was recorded from quadrat MBU55 in an area of cracking clay (vegetation type C1) in the centre of the survey area, 20 km south of Nullagine. This species is distributed through the Pilbara over a broad range of 390 km, but is restricted to heavy clay substrates (DBCA 2020b). The record from the survey area is 16.7 km northeast of the previous most northeastern location.

Themeda **sp. Hamersley Station (M.E. Trudgen 11431) (Priority 3)**
This perennial tussock grass occurred as scattered individuals in one quadrat (MBU66), one relevé (MBU-REL27) and at an opportunistic search location; two records were from drainage lines in vegetation type D4, while one was from vegetation type P3 on a plain. Another specimen that may potentially represent this species was collected from MBU50, in vegetation type P3 on a plain. *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) occurs over a range of approximately 385 km east-west and 300 km north-south through the Pilbara, with an outlying record another 200 km further south in the Little Sandy Desert bioregion (DBCA 2020b). Records are typically associated with areas of cracking clay plain, or sometimes creeklines through plains.




Plate 4.69: ***Themeda*** **sp. Hamersley Station (M.E. Trudgen 11431) (photos not from survey area).**

Goodenia nuda **(Priority 4)**
This slender annual herb was recorded as scattered individuals from three quadrats (MBU31, MBU35 and MBU47) located in creeklines or in low-lying areas on plains (vegetation types D5, P1 and P4), spread from 3.2 km north to 35.9 km south of Nullagine. This species has a broad distribution over 900 km east-west and 720 km north-south; the vast majority of records are from the Pilbara region, with single outlying records from the adjacent Gascoyne, Murchison, Little Sandy Desert and Great Sandy Desert bioregions (DBCA 2020b).



Plate 4.70: ***Goodenia nuda*** **(photos not from survey area).**

4.3.3 Introduced Flora

A total of 25 introduced flora species (weeds) were recorded from the survey area (Table 4.12), reflecting its location along a major road and including a settlement (Nullagine), as well as the other land use history of the area (particularly pastoral and mining purposes). One additional species, **Tamarix aphylla*, was recorded at Nullagine between the main survey area and the Nullagine Bypass.

Three of the weed species recorded, **Azadirachta indica* (Neem Tree), **Calotropis procera* (Calotrope) and **Tamarix aphylla* (Athel Tree), are declared plants under the WA BAM Act, as listed by the Agriculture and Food Division of the Department of Primary Industry and Regional Development (DPIRD 2020a). Athel Tree is also listed as a WoNS[7] (Thorp and Lynch 2000). **Azadirachta indica* and **Calotropis procera* are also listed as "Priority Alert Weeds" by the DBCA (see Department of Parks and Wildlife 2013a), with the former listed as being absent from the Pilbara region, and the latter as being absent from the conservation estate. As the survey area does not include any conservation estate, only the records of **Azadirachta indica* are required to be reported to DBCA.

The then Department of Parks and Wildlife's Weed Species Ranking (Department of Parks and Wildlife 2013a), which was derived from the Department's Weed Prioritisation Process (WPP) (Department of Parks and Wildlife 2013b), took into account the potential distribution, current distribution, ecological impact, invasiveness and feasibility of control to derive a broad qualitative weed species ranking corresponding to specific management actions. Several of the species recorded from the survey area were not ranked as part of this process (see Table 6.3). However, over half (14) of the species recorded have a 'Rapid' ranking for Invasiveness, with 10 of these species also having a 'High' ranking for Ecological Impact: **Aerva javanica, *Cenchrus ciliaris, *C. setiger, *Cynodon dactylon, *Echinochloa colona, *Malvastrum americanum, *Passiflora foetida* var. *hispida, *Setaria verticillata, *Tamarix aphylla* and **Vachellia farnesiana*. **Cenchrus ciliaris, *C. setiger, *Cynodon dactylon* and **Leucaena leucocephala* are also all classified by the Agriculture and Food Division of DPIRD as being Very High risk environmental weeds for the Pilbara (DPIRD 2020b).

7 For the current listing of Weeds of National Significance, go to http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html

Table 4.12: Summary of weed species recorded within the survey area, including WPP rankings.
Descriptions from WA Herbarium (2020), unless otherwise cited. Ecol. Imp. = Ecological Impact; Inv. = Invasiveness.

Species	Description	Declared Pest (DP) / WoNS / DBCA Priority Alert Weed (PA)	WPP – Weed Species Ranking		Distribution in Survey Area
			Ecol. Imp.	Inv.	
**Indigofera hochstetteri* (Kapok Bush)	Low shrub growing in floodplains and disturbed urban settings. Not common in the Pilbara; other known records are from north of the Great Northern Highway between the Sherlock and De Grey Rivers.	DP	–	–	Recorded from a single location in a creekline in the main survey area, 38.5 km S of Nullagine; not abundant, provided 0.1% cover.
**Azadirachta indica* (Neem Tree)	Recorded from Kununurra, Derby and Broome in the Kimberley region; becoming particularly invasive surrounding the latter town.	DP, PA	–	–	Scattered along the banks of the Nullagine River; 30 individuals recorded in total, including 4 individuals in the main survey area, and 6 individuals in the Nullagine Bypass.
**Calotropis procera* (Calotrope)	A rubbery-leaved shrub to small tree with milky sap. Widespread through the Kimberley along major rivers and roadways; uncommon in the Pilbara to date but recorded from locations including the De Grey River and south of Port Hedland.	DP, PA	–	–	Most records from Nullagine River, including scattered plants in both the main survey area and the Nullagine Bypass; single individuals also recorded from northernmost end of survey area and from 33 km S of Nullagine.
**Tamarix aphylla* (Athel Tree)	A dense tree growing to 12 m tall, with white to pink flowers in February or May. Widespread from Perth to the Kimberley, where it was often planted as a shade tree or to combat erosion.	WoNS, DP	H	R	Not recorded in the survey area; a single tree noted in the contextual area between the main survey area and the Nullagine Bypass.
**Aerva javanica* (Kapok Bush)	Erect perennial herb, often occurs on sandy soils. Originally introduced to assist with the revegetation of disturbed bushland; now widespread from Carnarvon to the Kimberley (Hussey et al. 2007).	–	H	R	Widespread throughout the survey area, typically occurring along road verges as scattered individuals or in small patches.
**Bidens bipinnata* (Bipinnate Beggartick)	Annual daisy growing to 90 cm tall, with yellow flowers between March and September. Commonly observed in association with Mulga vegetation and creeklines in the Pilbara. May occur in high densities within suitable habitats and given appropriate conditions, but on its own does not appear to cause exclusion of native flora species.	–	U	R	Recorded in small numbers from 4 locations spread through the survey area from 10.5 km N to 59 km S of Nullagine; records from creeklines and an area of Mulga.

Species	Description	Declared Pest (DP) / WoNS / DBCA Priority Alert Weed (PA)	WPP – Weed Species Ranking		Distribution in Survey Area
			Ecol. Imp.	Inv.	
**Cenchrus ciliaris* (Buffel Grass)	Perennial tussock grass growing to 1 m tall and flowering for most of the year. Introduced by pastoralists as a fodder species and now widespread through WA. This species has demonstrated allelopathic capacities, whereby it releases chemicals that inhibit the growth of other plants (Cheam 1984a, 1984b, Hussain et al. 2010), and it competes aggressively and effectively with native flora species. Commonly found along drainage lines, floodplains, in sandy coastal areas and disturbed sites, where it can form dense tussock grasslands. Reproduces by seed and short rhizomes; thought to be dispersed primarily by wind and water, but can also be spread through the movement of mammals, birds and vehicles.	–	H	R	Widespread and abundant throughout the survey area and in the Nullagine Bypass; particularly dense along many of the larger creeklines and associated floodplains.
**Cenchrus setiger* (Birdwood Grass)	Erect tussocky perennial grass closely related to Buffel Grass; grows in the same habitats, but is usually less common. Similarly introduced as a fodder species in pastoral areas and has since become a common weed in watercourses from Carnarvon to the Kimberley (Hussey et al. 2007).	–	H	R	
**Citrullus colocynthis* (Colocynth)	A trailing creeper with melon fruits, which is widespread in WA from inland of Perth to the Kimberley.	–	U	M	Recorded as scattered plants at 13 locations spread through the survey area from 16 km N to 66 km S of Nullagine.
**Cynodon dactylon* (Couch)	A perennial grass, cultivated for lawns. Recorded from the Southwest of WA to the northern Kimberley,	–	H	R	Recorded from 6 locations spread from Nullagine to 38.5 km S; most records of only scattered plants, with occasional more dense patches associated with large creeklines.
**Echinochloa colona* (Awnless Barnyard Grass)	An annual grass; common in wet areas in the Pilbara and Kimberley.	–	H	R	Recorded from 22 locations spread throughout the survey from the northernmost end to 52 km S of Nullagine; also recorded from 2 locations in the contextual area; most records of only scattered plants, with occasional more dense patches associated with large creeklines.
**Eragrostis cilianensis* (Stinkgrass)	A robust, often odorous, annual grass. Grows from the Southwest of WA to the Kimberley, with only one previous record from the Pilbara.	–	–	–	Recorded as scattered individuals at 6 locations spread from 10 km N to 51 km S of Nullagine, all associated with creeklines.

Species	Description	Declared Pest (DP) / WoNS / DBCA Priority Alert Weed (PA)	WPP – Weed Species Ranking		Distribution in Survey Area
			Ecol. Imp.	Inv.	
**Euphorbia hirta* (Asthma Plant)	An annual herb with hairy leaves, which is widespread from the Pilbara to the Kimberley.	–	L	S	Recorded from 3 locations in creeklines in the main survey area, spread from 27.3 km to 38.5 km S of Nullagine; 1 record from the Nullagine River in the Nullagine Bypass.
**Flaveria trinervia* (Speedy Weed)	Annual daisy to 40 cm tall, with an inflorescence consisting of a large dense cluster of yellow flower heads. Widespread through the Pilbara and Kimberley in a variety of habitats, including drainages and disturbed areas (Hussey et al. 2007).	–	–	–	Recorded from 3 locations in the main survey, spread from 15.8 km N to 62.5 km S of Nullagine.
**Leucaena leucocephala*	A tall shrub to tree to 6 m tall, with bipinnate leaves and long flat seed pads. Typically grows along rivers, in mangrove swamps and in monsoon forest among coastal dunes. Recorded from scattered locations between Exmouth and the Kimberley, with an outlying record inland at Mooloogool Station Homestead.	–	–	–	Restricted to the Nullagine River: single individual recorded in the Nullagine Bypass; 10 individuals recorded 300 m S in the contextual area.
**Malvastrum americanum* (Spiked Malvastrum)	Erect, perennial herb or shrub to 1.3 m tall, with yellow or orange flowers from April to July. A common introduced species associated with Mulga vegetation, hills, rockpiles, plains, drainage lines and floodplains. This species is widespread throughout the Kimberley, Pilbara, Gascoyne and Carnarvon bioregions.	–	H	R	Recorded from 24 locations spread throughout the main survey area; typically only present as scattered individuals, with very occasional records of hundreds of plants.
**Passiflora foetida* var. *hispida* (Stinking Passion Flower)	A woody climber growing to 9 m tall, with an unpleasant odour. It has cream-white-blue flowers from February to November, followed by small orange fruit.	–	H	R	Restricted to the Nullagine River; 3 individuals recorded from the main survey area, and 1 individual recorded nearby in the contextual area.
**Physalis angulata*	An annual herb with gooseberry fruit; is a common weed of creeklines and floodplains in the Kimberley, with scattered locations in the Pilbara and further south.	–	U	U	Recorded from 5 locations in the main survey area, spread from 27.2-52.1 km S of Nullagine, all associated with creeklines.
**Setaria verticillata* (Whorled Pigeon Grass)	Loosely tufted annual grass to 1.3 m tall. Commonly occurs in disturbed areas, in shrublands and on the edges of rivers and creeks from the Kimberley to the Pilbara (Hussey et al. 2007).	–	H	R	Single record from a creekline in the main survey area, 23.7 km S of Nullagine.
**Sigesbeckia orientalis* (Indian Weed)	Upright, slightly hairy annual herb, with opposite, toothed leaves, and small yellow flower-heads with a densely glandular indumentum. Distributed mainly in the Pilbara bioregion, with other records in the Central Ranges bioregion, at Exmouth and throughout the Southwest.	–	U	R	Single record from a low-lying area in the main survey area, 32 km S of Nullagine.
**Solanum nigrum* (Black Berry Nightshade)	Erect perennial herb or shrub to 1 m tall, with white flowers all year. Most common in the Southwest of WA, but also found less abundantly in the Pilbara in sheltered habitats such as Mulga vegetation and drainage lines.	–	L	R	Recorded as scattered plants at 2 locations in creeklines in the main survey area, 9.9 km and 52.1 km S of Nullagine.

Species	Description	Declared Pest (DP) / WoNS / DBCA Priority Alert Weed (PA)	WPP – Weed Species Ranking		Distribution in Survey Area
			Ecol. Imp.	Inv.	
**Sonchus oleraceus* (Common Sowthistle)	Short-lived annual herb growing to 1.5 m tall. This species is common and widespread in disturbed areas of WA from Wittenoom to the Nullarbor (Hussey et al. 2007).	–	L	R	Recorded as scattered plants at 2 locations in creeklines in the main survey area, 29.1 km and 52.1 km S of Nullagine.
**Stylosanthes hamata* (Verano Stylo)	A herb to low shrub, which is a common weed of the Kimberley region, with scattered records from the Pilbara coast and further inland. Particularly common along roadways and pastoral tracks.	–	–	–	Recorded from a single location in a creekline in the main survey area, 23.7 km N of Nullagine.
**Trianthema portulacastrum* (Giant Pigweed)	An annual herb growing on roadsides and disturbed soils. Recorded in northern Australia from the Pilbara to the Kimberley.	–	–	–	Recorded as scattered individuals from 3 locations in creeklines in the main survey area, spread from 32.8 km to 52.1 km S of Nullagine.
**Tribulus terrestris* (Caltrop)	A prostrate annual herb with prickly fruit. Grows throughout the State, typically on sandy soils in disturbed areas.	–	U	M	Recorded as scattered individuals from 3 locations in or near creeklines in the main survey area, spread from 36.3 km to 41.8 km S of Nullagine.
**Vachellia farnesiana* (Mimosa Bush)	Spreading, thorny shrub to 4 m tall, with dark grey bark, pinnate leaves, and yellow flowers in winter. Widespread from the Kimberley to near Perth, typically occurring along drainage systems and in adjacent low-lying areas (Hussey et al. 2007).	–	H	R	Widespread through the main survey area in creeks and on plains from Nullagine to the south, typically occurring as scattered individuals; scattered individuals also along the banks of the Nullagine River in the Nullagine Bypass.

WPP = Weed Prioritisation Process (Department of Parks and Wildlife 2013b); only species with rankings in both categories are listed:
Ecological Impact Ranking: H = High, L = Low, U = Unknown. **Invasiveness Ranking:** M = Moderate, R = Rapid, S = Slow, U = Unknown.

The more significant weed species are discussed briefly below.

- ***Indigofera hochstetteri***
  This species is a Declared Pest in the category of "s12 (C1 Prohibited)". Section 12 of the BAM Act requires that the species may only be imported and kept subject to permits; C1 organisms are those which should be excluded from all or part of WA; while the "Prohibited" classification requires that the species can only be kept under a permit by entities approved by the state authority.

  Vouchered records of **Indigofera hochstetteri* are currently limited to near-coastal locations between Sherlock River near Port Hedland, and the De Grey River to the east. The single record from the current survey appears to represent the first record of this species from further inland, and would warrant urgent control to prevent this species establishing more widely.

- ***Azadirachta indica* (Neem Tree)**
  This species is a Declared Pest in the category of "S22(2) Exempt". Section 22(2) of the BAM Act requires that any applicable import requirements must be satisfied when the species is imported, and the species may also be subject to control and keeping requirements; however the "Exempt" status for **Azadirachta indica* means that no permit or conditions are required for keeping. **Azadirachta indica* is a highly invasive species, and becoming a serious problem in some areas of the Kimberley (e.g. around Broome). It is listed as a "Priority Alert Weed" by the DBCA (Department of Parks and Wildlife 2013a), and the records from the Nullagine River should be reported to the Department, as they appear to be the first from the Pilbara bioregion.

  A total of 30 individuals were recorded during the current survey, with four of these occurring within the main survey area and two in the Nullagine Bypass. Urgent control of this species would be warranted, but would need to address the broader extent of the population.

- ***Calotropis procera* (Calotrope)**
  This species is a Declared Pest in the category of "S22(2) Exempt" (see **Azadirachta indica* for explanation of categories).

  Scattered mature plants of **Calotropis procera* were recorded in the vicinity of Nullagine, mostly from the banks and floodplains of the Nullagine River, in both the main survey area and the Nullagine Bypass. A single juvenile plant was also recorded from the road verge in a minor flowline at the northern end of the survey area; this plant was removed. One other plant was recorded 33 km south of Nullagine. **Calotropis* is quite common through the Kimberley region, and although it is not common in the Pilbara at this stage, has the potential to become a serious weed, particularly along major creeklines. Control of this species would be warranted to limit further spread.



Plate 4.71: ****Calotropis procera* on bank of Nullagine River.**



Plate 4.72: ****Calotropis procera* at north end of survey area.**

- ***Tamarix aphylla* (Athel Tree)**
  This species is a WoNS and a Declared Pest in the category of "S22(2) Exempt" (see *Azadirachta indica* for explanation of categories).

  A single tree of *Tamarix aphylla* was recorded planted in the rear of a residential property fringing the Nullagine River, in the contextual area between the main survey area and the Nullagine Bypass. This tree would obviously not be subject to control for the current development, but may need to be considered if any spread is noted into the survey area in future.

- ***Leucaena leucocephala* (Leucaena)**
  Although not listed as either a WoNS or Declared Pest, Leucaena is a serious environmental weed in some areas; it is becoming an increasing problem in areas of pindan around Broome in the Kimberley, while in the Pilbara, it has established and increased rapidly in creeklines around Tom Price in recent years. This species would presumably have the same capacity to invade riparian areas in the Nullagine locality.

  A single tree of Leucaena was recorded in the Nullagine Bypass, however other individuals were recorded nearby in the contextual area. Urgent control of this species would be warranted but would need to be undertaken through the broader catchment.

- ***Aerva javanica*, *Cenchrus ciliaris* and *C. setiger*** were all widespread through the survey area. *Aerva javanica* currently occurs in relatively small numbers and mainly along the immediate road verges (Plate 4.73), meaning that control may be feasible. It would not be possible to control either *Cenchrus* species; both are easily spread by wind, water and herbivores, and dense infestations are numerous and have spread along creeklines and into adjacent areas throughout the locality (Plate 4.74 and Plate 4.75).



Plate 4.73: *Aerva javanica* on road verge.



Plate 4.74: Dense tussock grassland of *Cenchrus* spp. on bank of creekline.



Plate 4.75: *Cenchrus* spp. tussock grassland on floodplain between branches of the Nullagine River.

4.4 Level 1 and Targeted Fauna Survey Results

4.4.1 Overview

A combined total of 134 species of vertebrate fauna were recorded from within the survey and contextual areas during the field survey (Table 4.13; Appendix 5). These included four significant mammal species, one of which was only tentatively confirmed (see Section 4.4.2).

Table 4.13: Overview of vertebrate fauna species recorded within the survey and contextual areas during the survey.

Fauna Group	Status	No. of Species	No. of Significant Species
Ground-dwelling Mammals	Native	6	1
	Introduced	3 (inc. 1 naturalised exotic)	0
Bats	Native	13	1
Birds	Native	78	0
Reptiles	Native	30	0
Amphibians	Native	4	0
	Total	**134**	**2**

4.4.2 Mammals

A total of 22 mammal species, including 13 bat species, were recorded from the survey area and contextual area during the survey (Appendix 5). This total included two introduced species, Cattle (*Bos taurus*) and Feral Cat (*Felis catus*), and one naturalised exotic species Dog/Dingo (*Canis familiaris familiaris* and/or *C. f. dingo*).

Two species of significance were recorded with certainty from the survey area; the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form; Section 4.4.2.1), and Western Pebble-mound Mouse (*Pseudomys chapmani*; Section 4.4.2.2). Both were also recorded from the contextual area. A track likely attributable to Northern Quoll (*Dasyurus hallucatus*) was also recorded from the survey area (Section 4.4.2.3), while a Ghost Bat (*Macroderma gigas*) was observed in close proximity to the contextual area (Section 4.4.2.5). An additional five mammal taxa of significance were assessed as "likely to occur" or "may occur" within the survey area; these are discussed in Sections 4.4.2.4 to 4.4.2.9 (see also Appendix 6).

4.4.2.1 Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form)

The Pilbara Leaf-nosed Bat is a sub-population of the Orange Leaf-nosed Bat that is endemic to the Pilbara and Ashburton regions of Western Australia, and is listed as Vulnerable under both the EPBC Act and BC Act. The Pilbara population is isolated from the main tropical populations in the Kimberley, Northern Territory and Queensland by 400 km of unsuitable habitat in the Great Sandy Desert.

The Pilbara Leaf-nosed Bat is semi-desert adapted and has specific roosting requirements, requiring roost sites in caves or mine adits with stable, very hot (28 – 32°C) and very humid (96 – 100%) microclimates (Churchill 2008). Caves deep enough to create this environment are relatively uncommon in the Pilbara (van Dyck and Strahan 2008), which limits the availability of diurnal roosts for this species. Observed foraging habitat includes *Triodia* hummock grassland, sparse tree and shrub savannah and riparian vegetation along drainage lines (Duncan et al. 1999).

Pilbara Leaf-nosed Bat calls were detected on ultrasonic ARUs at two sites in the survey area and three sites in the contextual area (Table 4.14; see also Appendix 17).

Table 4.14: Pilbara Leaf-nosed Bat records from the survey.

Site	Habitat	Easting † (mE)	Northing (mN)	Date	Notes
MBU01BAT	Major drainage	196115	7606613	06/03/2020	Survey area; 1 call detected.
MBU02BAT	Nullagine reservoir	202163	7578309	08/03/2020	Contextual area; 1 call detected.
MBU06BAT	Volcanic boulder hills and outcrop	201317	7571733	09/03/2020	Survey area; 1 call detected.
MBU07BAT	Rocky gully	201438	7570467	09/03/2020	Contextual area; 14 calls detected.
				10/03/2020	Contextual area; 1 call detected.
MBU08BAT	Permanent waterhole	199530	7565833	10/03/2020	Contextual area; 3 calls detected.

† Zone 51

4.4.2.2 Western Pebble-mound Mouse (*Pseudomys chapmani*)

The Western Pebble-mound Mouse is listed as a Priority 4 species by the DBCA. Previously described as endemic to the central and eastern parts of the Pilbara (Menkhorst and Knight 2011), it is now known to occur much more widely across the entire Pilbara region and into the Gascoyne (DBCA 2020b), where it is commonly found on stony hillsides with hummock grasslands (Menkhorst and Knight 2011). The species is well known for the extensive mounds of small stones it constructs, which are the most obvious indication of the species' occurrence in an area. Mounds are most common on spurs and gentle slopes where suitably sized stones are present (van Dyck and Strahan 2008).

Mounds constructed by this species were found at one location within the survey area and two locations within the contextual area (Table 4.15, Plate 4.76, Appendix 17), though none were recently active. However, there are also previous records in close proximity to the survey area, and extensive areas of potentially suitable habitat is present within the survey and contextual areas, so the species is likely to occur.

Table 4.15: Western Pebble-mound Mouse mound records from the survey.

Habitat	Easting † (mE)	Northing (mN)	Date	Notes
Gravelly spinifex plain	201760	7575652	09/03/2020	Survey area; inactive.
Open shrubland on low stony rise	183996	7536096	11/03/2020	Contextual area; inactive.
Mesa crest	187822	7522992	11/03/2020	Contextual area; inactive, very old.

† Zone 51



Plate 4.76: Inactive Western Pebble-mound Mouse mound in the contextual area.

4.4.2.3 Northern Quoll (*Dasyurus hallucatus*)

The Northern Quoll is listed as Endangered under both the EPBC Act and BC Act. It formerly occurred across much of northern Australia but is now restricted to six major areas. Two of these areas are in Western Australia: the northwest Kimberley and the Pilbara (Braithwaite and Griffiths 1994). The species is most abundant in open, rocky habitat and commonly utilises gorges, breakaways and hills, particularly for denning purposes, but also occurs near creek lines and drainage lines, where adjacent plains and vegetated areas provide habitats for foraging and dispersal of young (van Dyck and Strahan 2008). Many records from the Pilbara bioregion have come from dense vegetation along drainage areas, particularly where in contact with rocky mesa habitats (Garth Humphreys, Biota, pers. obs.) and from boulder tors of the Abydos-Woodstock Plain (How et al. 1991).

Northern Quolls exhibit male die-off, where almost all males die shortly after reproducing (Dickman and Braithwaite 1992, Oakwood 2000). The discrete male cohorts that arise within populations make quolls vulnerable to extinction. If no juvenile male quolls survive to adulthood, there will be no males for females to mate with the following year, and the local population will rapidly go extinct (Braithwaite and Griffiths 1994, Oakwood 2000).

A single track exhibiting a size and gait consistent with Northern Quoll was found in the sandy bed of a major drainage line in the northern end of the survey area (location 51J 196177mN, 7607146mE; Appendix 17). There is considerable good quality habitat for the species in the survey area and contextual area, particularly along major drainage lines and surrounding rocky areas, and the species has previously been recorded in close proximity to the survey area.

4.4.2.4 Bilby (*Macrotis lagotis*)

The Bilby is listed as Vulnerable under both the EPBC Act and the BC Act. The species formerly occurred in a wide range of semi-arid and arid habitats across over 70% of the Australian mainland, however it has declined markedly and now occupies less than 20% of its former range (Department of the Environment 2014). In Western Australia, there are disjunct populations in the Gibson Desert, south-western Kimberley, inland areas of the Pilbara and northern Great Sandy Desert (Friend 1990), and it has been reintroduced to parts of the southwest of WA. Extant populations occur in a variety of habitats, usually on landforms of low topographic relief and light to medium soils. In the Pilbara, the species prefers areas suitable for burrowing where the substrate comprises sand, soil, sandy clay or sandy gravel (DBCA 2018b), though it is also known from atypical stony gravelly areas (M. Dziminski, DBCA, pers. comm.). Additionally, the Bilby demonstrates strong association with particular species of *Acacia* that host root-dwelling larvae, which form a major food resource for the species in the Pilbara (DBCA 2018b).

Bilby appear to be strictly nocturnal and construct a substantial burrow system, which may be up to 3 m in length (Flannery et al. 1990, Strahan 1995). These burrows, along with other secondary evidence such as foraging diggings, scats and tracks, are usually the easiest means of detecting the presence of bilbies in an area.

During the survey, no primary or secondary evidence of Bilby was recorded from the survey area or contextual area, despite extensive search effort (Section 3.4.1). The majority of the survey area and contextual area is characterised by relatively hard and stony substrates that are less suitable for Bilby, though as noted above, they have been known to occur in such areas on occasion. Better quality habitat with soils more suitable for burrowing, and with stands of *Acacia* species known to host larval prey, occur primarily on the margins of drainage lines, particularly in the northern parts of the survey area and contextual area. Potential Bilby habitat within the survey and contextual areas is discussed in Section 4.4.7.

The species has previously been recorded in close proximity to the survey area as recently as 2014, and it is known from near Nullagine and Roy Hill Mine (M. Dziminski, DBCA, pers. comm.), so it was somewhat surprising that no evidence of the species was recorded during the survey. Bilbies are known to be highly mobile so it may be that they were simply absent from the survey area and contextual area at the time of survey as a result of normal nomadic movements. Another plausible explanation is habitat degradation, as prospective areas of habitat within the survey

area and contextual area almost invariably showed degradation as a result of cattle activity, rendering them poor quality. Habitat degradation by introduced livestock is listed as a threatening process for the Bilby, and cattle grazing has been implicated as a potential reason for local population decline in the eastern Pilbara region (Southgate 1990). However, without data on the condition of the habitat at the time of previous sightings, it is difficult to adequately evaluate this possibility. Despite the lack of evidence during the survey, based on the presence of suitable habitat within the survey area and contextual area, previous records from close proximity to the survey area, and documented nomadic habits of the species, the Bilby is considered likely to occur in the survey area.

4.4.2.5 Ghost Bat (*Macroderma gigas*)

The Ghost Bat is listed as Vulnerable under both the EPBC Act and BC Act. Ghost Bats previously occurred across most of inland and northern Australia, but are now restricted to the tropical and subtropical north of the continent (Churchill 2008). The distribution of this species is fragmented, with each population showing some genetic differentiation (Armstrong and Wilmer 2004), and populations in the Pilbara bioregion appear to be isolated from those in the Kimberley and Northern Territory. Ghost Bats occur in a broad range of landforms, with distribution influenced by the availability of suitable caves for roost sites (Churchill 2008). Ghost Bats may forage over large areas, with foraging ranges of over ~60 ha (Churchill 1998), and the size of their foraging area is probably inversely related to the productivity of their landscape. Scat material from the Ghost Bat is quite distinctive and can be used to identify temporary roosts or feeding sites. Feeding sites are also usually readily identifiable based on the accumulation of discarded remains of prey animals (van Dyck and Strahan 2008).

No Ghost Bats were recorded within the survey area or contextual area during the survey. However, a single Ghost Bat was observed in close proximity (1.1 km east) to the northern part of the contextual area (location 51J 197835mN 7600939mE; Appendix 17), and the species has also been recorded previously in close proximity to the survey area. As the species is known to forage over large areas, it is likely to forage over the survey area. However, as no suitable roost caves were detected within the survey area, the species is unlikely to use it for roosting.

4.4.2.6 Brush-tailed Mulgara (*Dasycercus blythi*)

The Brush-tailed Mulgara is listed as Priority 4 by the DBCA. This species is known to inhabit spinifex grasslands on sand plains and sandy swales between low dunes from south-western Queensland across the Simpson, Tanami, and Great Sandy Deserts of southern and central Northern Territory and central Western Australia. It is also known to inhabit areas on gibber (rock and pebble covered flat plains), and is closely associated with gently sloping to flat topographic positions rather than steep-sided sand ridges (Pavey et al. 2011). The present distribution of the Brush-tailed Mulgara, as shown from recent surveys and specimens lodged with the WA Museum, indicate that this species has a widespread distribution, including the Gascoyne, Murchison, Pilbara and some deserts in WA (Ric How, pers. comm., 2012).

The Brush-tailed Mulgara was not recorded from the survey area or contextual area during the survey. Substrates across the majority of the survey area were relatively hard and stony, and therefore not optimal habitat for Brush-tailed Mulgara. Areas of more suitable habitat generally occurred along the margins of drainage lines, however these were usually degraded by cattle. However, the species has previously been recorded in close proximity, and therefore may occur within the survey area.

4.4.2.7 Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardti*)

The mainland subspecies of the Spectacled Hare-wallaby is listed as Priority 4 by the DBCA. It formerly occurred across almost half the Australian continent, but has disappeared from southernmost parts of its range and declined in most other areas (Woinarski et al. 2014). It is now rare in WA, occurring in isolated populations in the Pilbara, Kimberley and Great Sandy Desert, though it has declined drastically in the Pilbara and recent records from that region are sparse (van Dyck and Strahan 2008, Woinarski et al. 2014). It occurs in a range of tussock and hummock grassland habitat, along with woodlands and shrublands with grassy understorey.

The Spectacled Hare-wallaby was not recorded from the survey area or contextual area during the survey, and has not previously been recorded in close proximity. The species reportedly prefers sandy substrates, which are relatively sparse in the area, but is known from the broader locality in the vicinity of Roy Hill, so it may occur in the survey area.

4.4.2.8 Long-tailed Dunnart (*Sminthopsis longicaudata*)

The Long-tailed Dunnart is listed as Priority 4 by the DBCA. It inhabits rocky, rugged habitat from the Pilbara and adjacent upper Gascoyne region east to the central Northern Territory and South Australia (Menkhorst and Knight 2011). The species was once considered to be rare and possibly threatened, however research has shown that it is relatively common and widespread but is restricted to a specific habitat (Burbidge 2004). Core habitat includes rocky plateaus, breakaways and scree slopes with hummock grass and shrubs, and tall open *Acacia* shrubland and woodland (van Dyck and Strahan 2008).

The Long-tailed Dunnart was not recorded from the survey area or contextual area during the survey, and has not previously been recorded in close proximity. However, it is known from the broader locality, and suitable rocky habitat is present within the survey area and contextual area, so it may occur.

4.4.2.9 Short-tailed Mouse (*Leggadina lakedownensis*)

The Short-tailed Mouse is listed as Priority 4 by the DBCA. In WA, its distribution includes the Pilbara and Kimberley regions (Menkhorst and Knight 2011). This species is known to occur in areas of open tussock and hummock grassland, *Acacia* shrubland and savannah woodland, on sandy soils and cracking clays (Morris et al. 2008). The species has been recorded from cracking clay communities from Cape Preston (60 km west of Dampier) in the west to the northern flanks of the Fortescue Marshes in the east (Halpern Glick Maunsell et al. 2001). It has also been recorded from hilltops (Dr Peter Kendrick, DBCA Karratha, pers. comm. 2003) and sandy coastal areas near Onslow (Roy Teale, Biota, pers. obs.).

The Short-tailed Mouse was not recorded from the survey area or contextual area during the survey. A small area of suitable cracking clay habitat was identified in the southern part of the survey area, but substrates in the majority of the survey area and contextual area are stony and less suitable. The species has not been previously recorded in close proximity to the survey area, but is known from the broader locality in the vicinity of Roy Hill, so it may occur within the survey area.

4.4.2.10 Other Notable Mammal Taxa

Other noteworthy mammal records from the survey include Rothschild's Rock-wallaby (*Petrogale rothschildi*), Black Flying-fox (*Pteropus alecto*) and Chocolate Wattled Bat (*Chalinolobus morio*).

Rothschild's Rock-wallaby is endemic to the Pilbara region, occurring in rocky areas such as cliff faces, rocks piles and scree slopes (Menkhorst and Knight 2011). The species was recorded from a small rocky gorge in the contextual area approximately 5 km south of Nullagine, both through direct observation and by motion cameras (MBU16M and MBU17M). Though it is restricted to the Pilbara region, it remains relatively widespread within the region and is not currently listed as significant.

The Black Flying-fox is widespread and common across coastal northern Australia from Exmouth to Sydney, roosting in camps in mangroves, paperbark forests and rainforests and foraging out across a variety of tropical forests and woodlands, as well as urban areas (Menkhorst and Knight 2011). Several individuals were recorded in the survey area around Nullagine township at night. Though common and widespread across its range, the species is of note as it is likely to be approaching its inland limit in the region. No records from the locality were returned during the desktop review; the nearest records on NatureMap are over 150 km from the survey area.

The Chocolate Wattled Bat occurs primarily in southern Australia, but occurs as far north as Townsville on the east coast (Menkhorst and Knight 2011). An isolated population is known from the vicinity of the Weeli Wolli-Marillana Creek system (McKenzie and Bullen 2009), approximately 90-100 km southwest of the southern part of the survey area. Echolocation calls consistent with

Chocolate Wattled Bat were detected at 11 of the 12 ultrasonic ARU recording sites, though only a few calls were recorded at most sites. Large numbers of calls were recorded from site MBU09BAT, a drainage line in the south of the survey area. Although the number of calls recorded at a site cannot be linearly extrapolated to individuals, large numbers of calls were recorded on three separate nights at MBU09BAT, which suggests higher levels of activity at the site than just a single individual being present for an extended period. These records should be treated with some caution, as calls of Chocolate Wattled Bat can be difficult to distinguish from other species of bat, and there do not appear to be any confirmed records in the Pilbara more than 40 km from Weeli Wolli Spring (McKenzie and Bullen 2009, DBCA 2020b). Confirmation of these records would likely require trapping and collection of genetic material.

4.4.3 Birds

A total of 78 bird species were recorded from the survey area and contextual area during the survey (Appendix 5). No bird taxa of significance were recorded during the survey, however five significant taxa were assessed as likely to occur or may occur within the survey area. These are discussed in Sections 4.4.3.1 to 4.4.3.5 (see also Appendix 6).

4.4.3.1 Grey Falcon (*Falco hypoleucos*)

The Grey Falcon is listed as Vulnerable under the BC Act and EPBC Act. The species is sparsely distributed across much of arid inland Australia, including the Pilbara, occurring mainly on lightly wooded plains and along major watercourses (Johnstone et al. 2013). Breeding usually takes place in taller trees such as River Red Gums (*Eucalyptus camaldulensis*), or on isolated man-made structures such as communications towers.

The Grey Falcon was not recorded during the survey, but has previously been recorded in close proximity and is likely to occur within the survey area and contextual area. All habitats within these areas are likely to be used for foraging, at least on occasion, with waterholes or other features attracting aggregations of birds likely to be particularly attractive. Suitable taller trees for breeding occur along the major drainage lines, primarily within the contextual area but with some smaller sections within the survey area.

4.4.3.2 Fork-tailed Swift (*Apus pacificus*)

The Fork-tailed Swift is listed as Migratory under both the EPBC Act and BC Act. It occurs as a non-breeding migrant across much of Australia from September to April, particularly in the northern half of the continent. In general, the species is most common closer to the coast, but occurs over much of the Pilbara. In Australia, the species is entirely aerial in habit, foraging for flying insects and even sleeping on the wing. It is highly mobile, often occurring in association with unsettled weather and low pressure systems (Johnstone and Storr 1998).

The Fork-tailed Swift was not recorded during the survey but has previously been recorded in close proximity to the survey area and occurs widely over the Pilbara. It is likely to be a sporadic visitor to airspace over all parts of the survey and contextual areas, particularly in association with thunderstorms and low-pressure systems.

4.4.3.3 Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is listed as Other Specially Protected Fauna under the BC Act. It occurs almost Australia-wide, but is absent from most deserts and the Nullarbor Plain (Johnstone and Storr 1998). This species inhabits a wide range of habitats including forest, woodlands, wetlands and open country (Pizzey and Knight 2007). Individuals maintain large home ranges of up to 30 km^2, and nest in recesses of cliff faces, tree hollows and along rivers (Johnstone and Storr 1998).

The Peregrine Falcon was not recorded during the survey, but has previously been recorded in close proximity and is likely to occur within the survey area and contextual area. As for the Grey Falcon, all habitats within these areas are likely to be used for foraging, with areas attracting bird aggregations being the most attractive. Suitable cliffs and taller trees for breeding occur primarily within the contextual area but with some smaller areas within the survey area.

4.4.3.4 Night Parrot (*Pezoporus occidentalis*)

The Night Parrot is listed as Critically Endangered under both the EPBC Act and BC Act. The species occurs in semi-arid and arid areas of inland Australia, with historical records indicating that it was widespread and relatively common in these areas up until the late 19th century (Murphy et al. 2017). Populations are currently known from the Murchison and north-eastern desert regions in WA, as well as from western Queensland.

Descriptions of the species' habitat preferences in the literature are broad, reflecting the wide variety of habitats from which the species was historically known. However, all currently known populations are associated with old-growth ringed spinifex (*Triodia* spp.; N. Jackett, pers. comm. 2019). Foraging habitats are broadly described as grasses and herbs that may or may not contain shrubs or low trees, with recently-studied populations foraging primarily on chenopods and seeding spinifex and other grasses (Murphy et al. 2017).

The Night Parrot was not recorded during the survey. Some small areas of suitable old-growth spinifex roosting habitat were identified within the survey area and contextual area, but these were small and relatively isolated, and no calls were detected on ARUs deployed at these sites. Night Parrots appear to call reliably form their roosts every evening (N. Jackett, Broome Bird Observatory, pers. comm.) and recording conditions during the survey were good, so it is unlikely that birds were using these areas as roost sites. More extensive areas of such habitat were identified in the broader locality east of Nullagine, and it is possible that habitat areas within the study area could be used as occasional roosts by birds usually roosting in these more extensive areas of habitat. There is also a possibility that small areas of suitable spinifex for roosting were not detected and thus not surveyed during the field survey, or that Night Parrots may use a wider range of roosting habitats than is currently known, as new populations continue to be discovered. There is potentially suitable foraging habitat within the survey area and contextual area, however most grassland areas of higher productivity appear to be degraded by the presence of cattle and introduced grasses (**Cenchrus* spp.), which is likely to lower their suitability for Night Parrots. Foraging habitat may be used intermittently according to conditions, so the reliability of detection in foraging areas is much lower than for roosting areas. The species is not known from any locations in close proximity to the survey area, but there are records from the broader locality (the study area). Overall, we have taken a precautionary approach and considered that this species may occur within the survey area.

4.4.3.5 Oriental Plover (*Charadrius veredus*)

The Oriental Plover is listed as Migratory under both the EPBC Act and BC Act. The species is a summer migrant to Australia, occurring primarily from September to April (Johnstone and Storr 1998). The species breeds in Mongolia, northern China and southern Siberia, and is a non-breeding migrant to Australia (Johnstone and Storr 1998). However, unlike most shorebird species, they are not particularly tied to wetland and coastal habitats while in Australia. Their preferred foraging habitats are sparsely vegetated open areas, including short-grassed or bare plains, bare wetland margins, and recently burnt areas (Johnstone and Storr 1998). This also includes similar man-made habitats, such as sports fields and airfields. The species will also use tidal mudflats, beaches, sewage ponds and freshwater wetland areas, primarily while on migration or for roosting during the heat of the day (Johnstone and Storr 1998, Menkhorst et al. 2017). They are mobile in response to conditions, and disperse across inland northern Australia during the wet season (Minton et al. 2013).

In the Pilbara, the species is more common in near-coastal regions, but occurs inland at least as far as Newman (Johnstone et al. 2013). There are no previous records in close proximity to the survey area, but it has been recorded in the broader locality. There is also suitable habitat within the survey and contextual areas; which is further confirmed by records of the Australian Pratincole during the survey, which shares similar habitat preferences to the Oriental Plover. As such, the species may occur within the survey area.

4.4.3.6 Other Notable Bird Taxa

Other noteworthy bird species recorded during the current survey included the Pilbara endemic subspecies of the Striated Grasswren (*Amytornis striatus whitei*), and the Australian Pratincole.

The Striated Grasswren occurs widely across arid and semi-arid regions of Australia, extending from the Pilbara region south and west across the southern central deserts as far as the mallee country in north-western Victoria. Up to four subspecies have been described, and are considered to represent full species by some authorities (e.g. Clements et al. 2019). The Pilbara subspecies occurs primarily on rocky slopes and hilltops with *Triodia* hummocks, and was recorded in the southern part of the survey area and contextual areas, as well as in close proximity to the contextual area in the north. The taxon still appears to be locally common in suitable habitat across the Pilbara (Johnstone et al. 2013), and is not currently listed as significant.

The Australian Pratincole is widespread and locally common across northern and inland eastern Australia. In the Pilbara, it is a relatively common visitor in northern coastal areas, but becomes less common inland (Johnstone et al. 2013), and no previous records from the locality were returned from the desktop review. A group of up to seven Australian Pratincole were recorded during the survey over several days about 9 km south of Bonney Downs homestead, foraging along the road and surrounding grassland within the survey area, and loafing in the vicinity of a dam in the contextual area.

4.4.4 Reptiles

A total of 30 species of reptile were recorded from the survey area and contextual area during the survey, none of which were of significance (Appendix 5). Three taxa of significance were assessed as likely to occur or may occur within the survey area, as discussed in Sections 4.4.4.1 to 4.4.4.3 (see also Appendix 6).

4.4.4.1 Pilbara Olive Python (*Liasis olivaceus barroni*)

The Pilbara Olive Python is a distinct subspecies of the Olive Python found across northern Australia, and is listed as Vulnerable under the EPBC Act and BC Act. The subspecies has a known distribution coinciding roughly with the Pilbara bioregion, with important populations known to occur in four areas: Pannawonica, Millstream, Tom Price and the Burrup Peninsula (DSEWPaC 2012). Preferred habitat for the Pilbara Olive Python includes gorges, escarpments, rocky outcrops and water holes where it may find suitable prey (DoAWE 2020b). It seeks shelter in caves, beneath boulders, in pools of water and occasionally in trees overhanging water (Bush and Maryan 2011). It is often associated with ephemeral or permanent water, but individuals have large home ranges (between 88 ha and 449 ha) and may be recorded in rocky habitats some distance from these features (Biota 2009).

Suitable habitat for Pilbara Olive Python was documented in the survey area and contextual area, particularly along major drainage lines and surrounding rocky areas (fauna habitats 9 – 11; see Section 4.4.6). The species has also previously been recorded in close proximity to the survey area, and is therefore likely to occur.

4.4.4.2 *Ctenotus nigrilineatus*

The skink species *Ctenotus nigrilineatus* is listed as Priority 1 by the DBCA. This little-known species has been recorded from several locations in the east Pilbara near Woodstock, Meentheena and Nullagine (Wilson and Swan 2017). It has so far been recorded from spinifex plains in association with granite rocky outcrops and watercourses (Wilson and Swan 2017).

This species was not recorded during the survey. However, it is known from the Nullagine region and has previously been recorded in close proximity to the survey area, and extensive areas of apparently suitable spinifex plain and volcanic boulder outcrop habitat exist within the survey area and contextual area (fauna habitat 3; see Section 4.4.6). Hence, we consider that it is likely to occur within the survey area.

4.4.4.3 *Anilios ganei*

The blind snake *Anilios ganei* is listed as Priority 1 by the DBCA, and is known from scattered locations across the Pilbara, from the Newman area in the east, west to Pannawonica and Millstream (DBCA 2020b). Early records of the species indicated that it may be associated with moist gorges and gullies (Wilson and Swan 2017), but they have since also been recorded from mulga woodland and rocky scree slopes (Biota internal database), suggesting a wider range of habitat preferences.

Habitat preferences of the species are still not well-understood, making accurate assessment of habitat suitability difficult. However, habitats consistent with those of previous records are present within the survey area and contextual area (fauna habitats 8 and 10; see Section 4.4.6), and the species is known from the broader locality. Hence, we consider that it may occur within the survey area.

4.4.4.4 Other Notable Reptile Taxa

Records of geckos from the genus *Gehyra* are of interest due to extensive recent taxonomic revisions within the genus, including the description of multiple new species from the Pilbara region (Doughty et al. 2018, Kealley et al. 2018). Members of this group were commonly observed during nocturnal searches during the survey. Morphological identification of the group is challenging and may not be possible with complete certainty without genetic data. However, based on distribution, morphology, habitat, and expert advice from Dr Paul Doughty (WA Museum), four species from this group were recorded, with relative confidence, during the survey:

- *Gehyra punctata*: commonly seen on rock faces, rocky outcrops, and boulder piles during nocturnal searches (fauna habitats 3 and 10; see Section 4.4.6). Generally larger-bodied with a broad snout, reddish upperparts with irregular-shaped blackish and pale spots or bars, arranged roughly in rows, usually paired and often in contact, particularly on tail (Plate 4.77);
- *Gehyra pilbara*: one individual was found on a termite mound during nocturnal search MBU01N (fauna habitat 5; see Section 4.4.6). Smaller-bodied with very short snout, reddish upperparts, with dark and pale spots not paired or in contact and dark barring on tail (Plate 4.78);
- *Gehyra media*: at least two individuals seen on a gently-sloping stony plateau during nocturnal search MBU05N (fauna habitat 1; see Section 4.4.6). Smaller-bodied with narrower snout than those identified as *G. punctata*; reddish upperparts with small dark and pale spots scattered evenly, but not forming rows and usually not paired or in contact (Plate 4.79). Difficult to separate from *G. micra* with certainty; and
- *Gehyra montium*: two individuals found on vegetation in drainage lines during nocturnal search MBU06N (in fauna habitat 9; see Section 4.4.6) and one on a building in Nullagine town. Size was variable between the individuals; all had greyish upperparts and dark bars (anterior) in contact with pale spots (posterior), with variable suggesting of dark longitudinal lines but generally lacking full "network" pattern (Plate 4.80).



Plate 4.77: *Gehyra punctata* recorded during a nocturnal search in rocky habitat.



Plate 4.78: *Gehyra pilbara* recorded on a termite mound during nocturnal search (MBU01N).



Plate 4.79: Suspected *Gehyra media* recorded from stony hills during nocturnal search (MBU05N).



Plate 4.80: *Gehyra montium* recorded in Nullagine town.

The *Gehyra* species recorded during the current survey, or otherwise known to be present in the locality, have been shown to be widespread (Doughty et al. 2018, Kealley et al. 2018) and are not listed as significant.

Three other reptile taxa recorded during the survey are also endemic or near-endemic to the Pilbara region, including:

- Pilbara Cave Gecko (*Heteronotia spelea*);
- *Ctenotus duricola*; and
- Northern Pilbara Rock Goanna (*Varanus pilbarensis*).

The Pilbara region is home to a relatively high number of reptile taxa endemic and near-endemic to the region, so it is unsurprising that several taxa recorded during the survey are endemics. None of these species are currently listed as significant.

4.4.5 Amphibians

Four species of amphibian were recorded in the survey area and contextual area during the survey (Appendix 5). None of these were of significance.

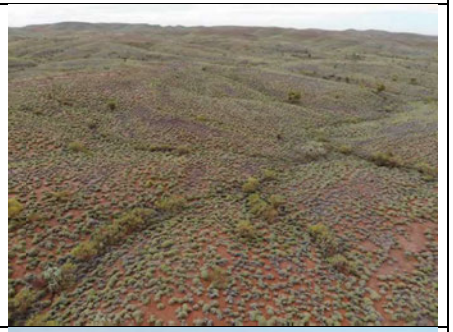
4.4.5.1 Notable Amphibian Taxa

The most notable record amongst the amphibian species recorded was the Pilbara Froglet *Uperoleia saxatilis*, which was recorded from several watered areas in the survey area and contextual area. This species is endemic to the Pilbara region, but is widespread within the region and not currently listed as significant.

4.4.6 Fauna Habitats

The fauna habitats defined for the survey and contextual areas aligned broadly with the landforms present, with further delineation of some isolated habitats that supported distinct fauna assemblages. A total of 15 habitat types were described for the survey area and contextual area. Details and attributes of these habitat types are presented in Table 4.16 and mapped in Appendix 17.

Table 4.16: Fauna habitats and associated attributes within the survey area and local area (comprising the survey area plus contextual area).

Habitat	Description	Area (ha) and Proportion (%) of Survey Area	Extent in Local Area (ha)	Proportion of Local Area (%)	Habitat Quality	Fauna Associations	Example Photograph
Hills and Mesas							
HS: Low rolling stony hills	Dominant habitat of the contextual area, occurring on hills with rocky and stony substrates. The vegetation was dominated by mixed *Triodia* hummock grasslands, with scattered trees, shrubs, herbs and grasses.	582.7 (25.1%)	5,176.2	11.3%	Good; cattle grazing and recent fire in some areas.	Species with preference for rocky substrates would be expected to be associated with this habitat type (e.g. the skink *Ctenotus saxatilis* and dragon *Ctenophorus caudicinctus*). This habitat would also be suitable for the Western Pebble-mound Mouse (*Pseudomys chapmani*), which constructs extensive mounds of small stones and is typically found on spurs and gentle slopes where suitably-sized stones are present.	
MB: Mesa breakaways and scree slopes	Ironstone mesa formations supporting overhangs, caves and rocky boulders.	6.1 (0.3%)	154.6	4.0%	Excellent; the majority of this habitat type was intact, with a minor portion recently burnt.	The caves and crevices in this habitat type would represent core roosting and denning habitat for a number of Threatened fauna species, including the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*), Ghost Bat (*Macroderma gigas*) and Northern Quoll (*Dasyurus hallucatus*). Other species associated with rocky crevices and hills include the monitors *Varanus pilbarensis* and *V. acanthurus*.	
HB: Volcanic boulder hills and outcrops	Volcanic (basalt/dolerite and rhyodacite) boulder hills and outcrops, typically supporting *Triodia wiseana* and/ *T. epactia* hummock grasslands.	148.6 (6.4%)	1,331.4	11.2%	Excellent; minimal cattle and fire disturbance.	The larger boulder areas occurring in this habitat may provide denning opportunities for the Northern Quoll (*Dasyurus hallucatus*), while smaller boulder areas would provide connective habitat for commuting to adjacent areas. The skink species *Ctenotus nigrilineatus* is also known from outcrops in association with spinifex grasslands. Other fauna associated with this habitat include the rock-inhabiting geckoes *Heteronotia spelea* and *Gehyra punctata*, the latter of which was recorded in abundance from this habitat type.	

Habitat	Description	Area (ha) and Proportion (%) of Survey Area	Extent in Local Area (ha)	Proportion of Local Area (%)	Habitat Quality	Fauna Associations	Example Photograph
Plains							
GSP: Gravelly spinifex plains	A distinctive habitat type in the survey area, restricted to areas of the Mosquito land system near Nullagine. Open spinifex hummock grassland dominated by *Triodia longiceps* over a quartz gravel substrate.	130.8 (5.6%)	605.8	21.6%	Good; some historical clearing close to Nullagine town.	Species with general habitat associations and spinifex specialists would be expected to occur in this habitat type. The spinifex hummocks may also represent roost habitat for the Threatened Night Parrot (*Pezoporus occidentalis*).	
OS: Open shrubland/woodland on spinifex plains	Open *Acacia* over spinifex hummock grasslands, occasionally supporting termite mounds, over stony substrate on broad undulating plains.	732.0 (31.6%)	3,736.0	19.6%	Good; some signs of impact from cattle grazing, weed persistence and recent fire.	Species with particular associations to spinifex (e.g. mammals that forage on seeds, such as *Pseudomys hermannsburgensis* and *P. desertor*), or with associations to stony flats (e.g. the dragon *Tympanocryptis fortescuensis*), and a wide range of species that utilise shrubs and spinifex for cover and/or foraging would be expected to occur in this habitat. Additionally, species that utilise termitaria as refugia or for foraging purposes would be associated with this habitat (e.g. *Gehyra pilbara*, which is a termitaria specialist, was recorded from termite mounds within this habitat type). Some shrublands support *Acacia* species that contain root-dwelling larvae, an important food resource for the Threatened Bilby (*Macrotis lagotis*).	
CCP: Cracking clay plains	Heavy clay and stony substrates on basalt, supporting open hummock grasslands of *Triodia longiceps* and *T. epactia* with patches of annual grasses and herbs.	44.3 (1.9%)	256.4	17.3%	Poor; impacted by cattle grazing.	Cracking clay, often supporting native grasslands, is the primary mainland habitat for the Priority species *Leggadina lakedownensis*, which burrows in deep cracks formed in clay.	
GP: Grassland plains	A unique habitat type in the survey and context area. Flat plains supporting open mixed *Triodia* and perennial herb grassland over stony substrate.	28.6 (1.2%)	203.4	14.1%	Excellent.	A number of bird species have strong associations to open grasslands. In particular, the Australian Pratincole and Brown Songlark were only recorded from this habitat type, while Horsfield's Bushlark was also mostly recorded from this habitat. The open vegetation would provide ideal hunting opportunities for a range of bird of prey species, including the Grey Falcon and Spotted Harrier, however these species would not be restricted to this habitat.	

Habitat	Description	Area (ha) and Proportion (%) of Survey Area	Extent in Local Area (ha)	Proportion of Local Area (%)	Habitat Quality	Fauna Associations	Example Photograph
MW: Mulga woodland plains and knolls	An isolated habitat type within the survey area and context area. The vegetation comprised Mulga (*Acacia aptaneura*) low woodland over heavy clay substrate on plains, and on a few small rocky knolls.	10.6 (0.5%)	58.8	18.0%	Poor; evidence of continued grazing, weeds and some areas of intense fire, causing damage to vegetation structure.	Where occurring on plains, the heavy clay soil substrate and mulga woodland provides ideal habitat for mygalomorph spiders; a number of these burrows were observed within this habitat type. Gecko species that utilise these spider burrows as diurnal shelters would also favour this habitat type (e.g. *Diplodactylus bilybara*, which shelters in vacant spider holes, blocking the shaft with its tail). Species favouring mulga woodlands would also be associated with this habitat, such as *Strophurus wellingtonae*, along with those that utilise Mulga bark and hollows as shelter, for example *Varanus caudolineatus* and *V. bushi.*	
Drainage Lines and Waterholes							
MDL: Major drainage lines and associated tributaries	Open Eucalypt forest and associated shrubland	152.6 (6.6%)	998.1	15.3%	Good to Poor; some aggressive weeds present and heavily used by cattle.	Species relying on water and moist refugia would be associated with this habitat type. A number of amphibians (*Cyclorana maini, Litoria rubella, Platyplectrum spenceri* and *Uperoleia saxatilis*), the Flat-shelled Turtle (*Chelodina steindachneri*) and numerous fish species were recorded from this habitat type. This habitat would also provide drinking resources for bats, and potential foraging and commuting resources for the Northern Quoll (*Dasyurus hallucatus*) and Pilbara Olive Python (*Liasis olivaceus barroni*). The dragon *Gowidon longirostris* is usually associated with trunks and branches in eucalypt-lined watercourses.	
RTG: Rocky tributaries and gullies	Drainage lines with rocky free face areas, supporting ephemeral rock pools. Vegetation consisting of sparse tall *Eucalyptus* and *Melaleuca* (tea-tree).	5.6 (0.2%)	29.5	18.9%	Excellent to Good; some impact from cattle grazing and weeds, but mostly intact.	This habitat would provide foraging and commuting resources for the Threatened Northern Quoll (*Dasyurus hallucatus*) and Pilbara Olive Python (*Liasis olivaceus barroni*). The Priority species *Anilios ganei* is also associated with moist gorges and gullies. Other species associated with this habitat include rock-dwelling arboreal geckos such as *Oedura fimbria* and *Gehyra pilbara*, which were recorded during the survey.	
PW: Permanent waterholes	Natural spring-fed waterholes supporting ephemeral aquatic vegetation, together with *Ficus brachypoda* (Rock Fig), and sparse Eucalypts. Waterholes typically surrounded by rocky boulders. Only one such waterhole found within the context area, with another found immediately east.	–	0.2	–	Good, some evidence of grazing, but habitat mostly remained intact.	As with habitat type 9, species reliant on water such as amphibians, turtles and fish would be associated with this habitat. The Pilbara Olive Python (*Liasis olivaceus barroni*) is also associated with rocky areas close to water, while the rocky boulders would provide potential denning habitat for the Northern Quoll (*Dasyurus hallucatus*). This habitat would also provide drinking and foraging habitat for a number of bat species.	

Habitat	Description	Area (ha) and Proportion (%) of Survey Area	Extent in Local Area (ha)	Proportion of Local Area (%)	Habitat Quality	Fauna Associations	Example Photograph
MFL: Minor flowlines	*Eucalyptus* and *Corymbia* low woodlands over tall shrublands to open scrub of *Acacia, Grevillea* and *Gossypium* species.	27.3 (1.2%)	199.2	13.7%	Good: some cattle grazing and weed presence, however mostly intact.	This habitat type contains a number of flowering tree and shrub species that would provide foraging resources for various bird species. The relatively dense shrub/tree overstorey would also provide shelter for macropods, and for semi-arboreal reptiles such as *Gowidon longirostris.*	
Artificial / Degraded Habitats							
NR: Nullagine reservoir	Permanent water catchment for Nullagine town. Man-made feature created around a natural drainage line.	0.5 (0.02%)	5.0	9.1%	Good, however little natural vegetation structure remains as a result of clearing and altering of the landscape.	Surrounding ephemeral seeps provide habitat for a range of frog species including the Pilbara Toadlet (*Uperoleia saxatilis*), Sheep Frog (*Cyclorana maini*) and Little Red Tree Frog (*Litoria rubella*), which were all recorded from this area. The reservoir would also provide foraging habitat for a number of bat species.	
Man-made dam	Man-made dam surrounded by old-growth ringed spinifex on stony plains.	–	0.4	–	Good to Poor: Poor at dam, with heavy cattle trampling around margins of dam; Good in surrounding spinifex, as stony plains further from dam are mostly intact.	Potential nesting and foraging habitat for Night Parrot (*Pezoporus occidentalis*). This habitat type also provides drinking resource for a wide range of bats and birds, and hunting opportunity for birds of prey.	
DG: Degraded grassland	**Cenchrus* spp. tussock grassland fringing Nullagine River.	18.1 (0.8%)	63.0	28.8%	Poor; heavy grazing by cattle, understorey dominated by introduced grasses, and few native overstorey species present.	Although some bird species would forage in this habitat, potentially including significant birds of prey, it would not be expected to provide any particular resources for most fauna other than introduced predators and herbivores.	
Cleared	Cleared roads, tracks, gravel pits etc.	431.4 (18.6%)	699.0	61.7%	N/A	N/A	

4.4.7 Significant Fauna Habitat

4.4.7.1 Bilby

The Bilby occurs in low densities throughout its range, and is known to be highly mobile, responding to fluctuations in resource availability by moving into areas of prospective habitat when conditions are favourable, and out of areas when resources are depleted (Cramer et al. 2016). Habitat within the survey area and contextual area was assessed following criteria outlined in Section 3.4.1.4, which also consider the nomadic nature of the Bilby and its potential to be present wherever suitable habitat is, at any time, given optimal conditions. Based on the presence of suitable food source plants and substrate within vegetation of an appropriate fire history age, a total of 819.5 ha of the survey area was classed as being High or Moderate prospective habitat for the Bilby (Table 4.17). Bilby habitat mapping is presented in Appendix 18.

Table 4.17: Extent of prospective Bilby habitat in the local area.

Prospective Habitat Category	Extent in Local Area (Survey Area + Contextual Area) (ha)	Extent in Survey Area	
		Area (ha)	Proportion of Local Area
High	292.9	113.5	38.8%
Moderate	4,831.5	706.0	14.6%
Low	8,392.4	1,412.7	16.8%

4.4.7.2 Other Significant Species

The fauna habitats utilised by all other significant species recorded, likely to occur or that may occur in the survey area, are detailed in Table 4.18.

Table 4.18: Fauna habitat utilisation by significant species.

Species	Common Name	Fauna Habitats
Recorded		
Rhinonicteris aurantia Pilbara form	Pilbara Leaf-nosed Bat	MB, HB, MDL, RTG, PW, NR, Man-made dam
Pseudomys chapmani	Western Pebble-mound Mouse	HS, GSP
Likely to occur		
Dasyurus hallucatus	Northern Quoll	MB, HB, MDL, RTG, PW
Macroderma gigas	Ghost Bat	MB, MDL, RTG, PW, NR, Man-made dam
Liasis olivaceus barroni	Pilbara Olive Python	MB, MDL, RTG, PW
Falco hypoleucos	Grey Falcon	All (particularly MDL, PW, NR, Man-made dam)
Apus pacificus	Fork-tailed Swift	All
Falco peregrinus	Peregrine Falcon	All (particularly MB, MDL, PW, NR, Man-made dam)
Ctenotus nigrilineatus	-	HB
May occur		
Pezoporus occidentalis	Night Parrot	GSP, Man-made dam
Charadrius veredus	Oriental Plover	GP
Anilios ganei	-	MW, RTG
Dasycercus blythi	Brush-tailed Mulgara	OS
Sminthopsis longicaudata	Long-tailed Dunnart	MB, OS
Lagorchestes conspicillatus leichardti	Spectacled Hare-wallaby	HS, GSP, OS
Leggadina lakedownensis	Short-tailed Mouse	CCP

5.0 Conclusions

5.1 Significant Communities

No TECs were identified in the survey area and none would be expected to occur, given the location of the area and the habitats and vegetation types present.

Two PECs were recorded in the survey area:

- Vegetation type P1 occurred around Nullagine and was equivalent to the "Stony saline plains of the Mosquito land system" PEC (Priority 3). A total of 130.8 ha was mapped in the survey area, which represented 21.6% of the extent in the local area.
- Vegetation type C1 appears to correspond to the "Cracking clays of the Chichester and Mungaroona Range" assemblage (Priority 1) of the "Four plant assemblages of the Wona land system" PEC. A total of 44.4 ha was mapped in the central section of the survey area, which comprised 17.3% of the mapped extent in the local area.

5.2 Significant Flora

No Threatened flora have been recorded from the survey area, and none are expected to occur.

A total of 14 Priority flora species have been recorded from the survey area, and it is considered that two additional species may occur (Table 5.1). The most significant of these are the records of the Priority 1 species *Acacia aphanoclada* and *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795), both of which have relatively restricted distributions (less than 70 km at the widest point).

Table 5.1: Significant flora recorded within the survey area, or assessed as having the potential to occur.

Species	Significance
Recorded	
Acacia aphanoclada	P1
Acacia cyperophylla var. *omearana*	P1
Atriplex spinulosa (historical records only)	P1
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1
Euphorbia inappendiculata var. *inappendiculata*	P2
Ipomoea racemigera	P2
Paspalidium retiglume	P2
Eragrostis crateriformis	P3
Nicotiana umbratica	P3
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3
Swainsona thompsoniana	P3
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3
Goodenia nuda	P4
May occur	
Iotasperma sessilifolium	P3
Rostellularia adscendens var. *latifolia*	P3

With respect to the species listed above, only the Priority 1 species are considered well documented with respect to their distribution in the survey area. Most of the other species are annual grasses or herbs, which are logistically impractical to fully survey, even under optimal conditions. For these species it is considered more appropriate to use habitat as a surrogate for

populations when considering potential impacts. For most of the vegetation types mapped for this study, less than 25% of the local extent (i.e. the total mapped in the survey area and contextual area) occurs within the survey area. Exceptions comprise P4 (39% in the survey area), P5 (48%), D7 (32%) and D8 (29%). Only one of these units (P4) was associated with significant flora records, specifically the Priority 1 *Acacia aphanoclada* and Priority 4 *Goodenia nuda*, and these species were both recorded from other vegetation types.

5.3 Significant Fauna

Two species of significance, the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form; Vulnerable) and Western Pebble-mound Mouse (*Pseudomys chapmani*; Priority 4), were recorded with certainty from the survey area during the survey (Table 5.2).

A track that was likely attributable to Northern Quoll (*Dasyurus hallucatus*; Endangered) was also recorded within the survey area, and a Ghost Bat (*Macroderma gigas*; Vulnerable) was observed in close proximity to the contextual area; both species were considered likely to occur within the survey area. In addition, based on previous records from the region and an assessment of habitat within the survey and contextual areas, six other significant taxa were considered likely to occur, and a further seven may occur within the survey area (Table 5.2).

Table 5.2: Significant fauna recorded within the survey area, or assessed as "likely to occur" or "may occur".

Species	Common Name	Significance †	
		State	Federal
Recorded			
Rhinonicteris aurantia Pilbara form	Pilbara Leaf-nosed Bat	VU	VU
Pseudomys chapmani	Western Pebble-mound Mouse	P4	-
Likely to occur			
Dasyurus hallucatus	Northern Quoll	EN	EN
Macroderma gigas	Ghost Bat	VU	VU
Macrotis lagotis	Bilby	VU	VU
Liasis olivaceus barroni	Pilbara Olive Python	VU	VU
Falco hypoleucos	Grey Falcon	VU	VU
Apus pacificus	Fork-tailed Swift	MI	MI
Falco peregrinus	Peregrine Falcon	OS	-
Ctenotus nigrilineatus	–	P1	-
May occur			
Pezoporus occidentalis	Night Parrot	CR	EN
Charadrius veredus	Oriental Plover	MI	MI
Anilios ganei	–	P1	-
Dasycercus blythi	Brush-tailed Mulgara	P4	-
Sminthopsis longicaudata	Long-tailed Dunnart	P4	-
Lagorchestes conspicillatus leichardti	Spectacled Hare-wallaby	P4	-
Leggadina lakedownensis	Short-tailed Mouse	P4	-

† CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory, OS = Other Specially Protected, P1 = Priority 1, P4 = Priority 4.

6.0 References

ALA (2021). Atlas of Living Australia [WWW Document]. Database, . Retrieved from bie.ala.org.au.

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

Armstrong, K. M., and W. J. Wilmer (2004). *The importance of determining genetic population structure for the management of Ghost Bats,* Macroderma gigas*, in the Pilbara region of Western Australia.* Oral presentation at the 11th Australasian Bat Society Conference, Toowoomba, Queensland.

Astron (2014). The Gap and Fortescue River Bridge Realignment Level 1 Vegetation Flora and Fauna NVCP Assessment. Unpublished report prepared for Main Roads Western Australia, Astron Environmental Services, Western Australia.

Australasian Bat Society (2006). Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors. *The Australian Bat Society Newsletter* 27:6–9.

Bamford Consulting Ecologists (2013). BC Iron Nullagine Project Extension Areas – Bonnie East, Warrigal North and Coongan: Assessment of Fauna Values. Unpublished report for Strategen Consultants, Bamford Consulting Ecologists, Perth, Western Australia.

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

Beard, J. S. (1975b). *Vegetation Survey of Western Australia : Pilbara. 1:1,000,000 Vegetation Series : Explanatory Notes to Sheet 5*. University of Western Australia Press, Western Australia.

Binks, R. M., C. F. Wilkins, A. S. Markey, M. N. Lyons, and M. Byrne (2020). Genomic data and morphological re-assessment reveals synonymy and hybridisation among *Seringia* taxa (Lasiopetaleae, Malvaceae) in remote north-western Australia. *Taxon* 69(2):307–320.

Biologic (2018). Roy Hill Level 1 Targeted Vertebrate Fauna Assessment Updated. Unpublished report prepared for Roy Hill Holdings Pty Ltd, Biologic Environmental Survey, Western Australia.

Biota (2004a). Vegetation and Flora Survey of the Proposed FMG Stage B Rail Corridor and Mindy Mindy, Christmas Creek, Mt Lewin and Mt Nicholas Mine Areas. Unpublished report prepared for Fortescue Metals Group, December 2004, Biota Environmental Sciences, Western Australia.

Biota (2004b). Hope Downs Additional Rail Corridor – Chichester Range: Flora and Vegetation Survey. Unpublished report prepared for Hope Downs Management Services, January 2004, Biota Environmental Sciences, Western Australia.

Biota (2004c). Hope Downs Rail Corridor Extension - Hamersley Range: Flora and Vegetation Survey. Unpublished report prepared for Hope Downs Management Services, January 2004, Biota Environmental Sciences, Western Australia.

Biota (2005). Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage B Rail Corridor and Mindy Mindy, Christmas Creek, Mt Lewin and Mt Nicholas Mine Areas. Unpublished report prepared for Fortescue Metals Group, January 2005, Biota Environmental Sciences, Western Australia.

Biota (2009). A Two-Phase Fauna Survey of the West Turner Syncline Area. Unpublished report prepared for Rio Tinto Iron Ore, Biota Environmental Sciences, Western Australia.

Biota (2013). Rangelands Landform Field Guide. Internal document, Biota Environmental Sciences, Western Australia.

Biota (2015). Bonney Downs Station ESRM Plan. Unpublished report prepared for Rangelands NRM, November 2015, Biota Environmental Sciences, Western Australia.

Biota (2018). Asian Renewable Energy Hub Detailed Vegetation and Flora Survey. Unpublished report prepared for NW Interconnected Power, November 2018, Biota Environmental Sciences, Western Australia.

Braithwaite, R. W., and A. D. Griffiths (1994). Demographic variation and range contraction in the northern quoll, *Dasyurus hallucatus* (Marsupialia: Dasyuridae). *Wildlife Research* 21(2):203–217.

Burbidge, A. A. (2004). *Threatened Animals of Western Australia*. Department of Conservation and Land Management, Perth.

Bureau of Meteorology (2020). Climate Statistics for Australian Locations [WWW Document]. Retrieved February 20, 2020, from http://www.bom.gov.au/climate/averages/tables/cw_007176.shtml.

Bush, B., and B. Maryan (2011). *Field Guide to the Snakes of the Pilbara, Western Australia*. Western Australian Museum, Perth.

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

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

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

Christidis, L., and W. E. Boles (2008). *Systematics and Taxonomy of Australian Birds*. CSIRO Publishing, Melbourne.

Churchill, S. (1998). *Australian Bats*. Reed New Holland, Sydney.

Churchill, S. K. (2008). *Australian Bats*, 2nd edition. Allen and Unwin, Australia.

Clarke, K., and R. Gorley (2006). *Primer v6 : User Manual/Tutorial.* PRIMER-E Ltd, Plymouth, UK.

Clements, J. F., T. S. Schulenberg, M. J. Iliff, S. M. Billerman, T. A. Fredericks, B. L. Sullivan, and C. L. Wood (2019). The eBird/Clements Checklist of Birds of the World: v2019. Retrieved from https://www.birds.cornell.edu/clementschecklist/download/.

Coffey (2015). Level 2 Flora and Vegetation Assessment Perth–Darwin National Highway. Unpublished report NLWA-03-EN-RP-0016, Rev 1, prepared for Main Roads Western Australia, May 2015, Coffey Environments Australia.

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

Cramer, V. A., M. A. Dziminski, R. Southgate, F. M. Carpenter, R. J. Ellis, and S. van Leeuwen (2016). A conceptual framework for habitat use and research priorities for the greater bilby (*Macrotis lagotis*) in the north of Western Australia. *Australian Mammalogy* 39(2):137–151.

DAA (2020). Aboriginal Heritage Places (DPLH-001). Department of Aboriginal Affairs. Retrieved from https://catalogue.data.wa.gov.au/dataset/aboriginal-heritage-places.

DBCA (2017a). Guidelines for Surveys to Detect the Presence of Bilbies, and Assess the Importance of Habitat in Western Australia. Version 1 - August 2017, Department of Biodiversity, Conservation and Attractions.

DBCA (2017b). Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia. Department of Biodiversity, Conservation and Attractions.

DBCA (2017c). The conservation and management of the bilby (*Macrotis lagotis*) in the Pilbara. Department of Biodiversity, Conservation and Attractions, Perth, WA.

DBCA (2018a). Greater Bilby Survey: La Grange Project Area. Department of Biodiversity, Conservation and Attractions, Perth, WA.

DBCA (2018b). The conservation and management of the bilby (*Macrotis lagotis*) in the Pilbara. Annual Report 2017 - 18, April 2018, Department of Biodiversity, Conservation and Attractions, Perth, WA.

DBCA (2020a). Priority Ecological Communities for Western Australia, Version 30. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, 28 July 2020.

DBCA (2020b). NatureMap: Mapping Western Australia's biodiversity [WWW Document]. Retrieved from https://naturemap.dbca.wa.gov.au/.

DEC (2010). Definitions, Categories and Criteria for Threatened and Priority Ecological Communities. Species and Communities Branch, Department of Environment and Conservation, December 2010.

Department of Parks and Wildlife (2013a). Pilbara Region - Impact and Invasiveness Rankings.xls. List of weed rankings for the Pilbara derived from the DPaW Invasive Plant Prioritisation Process, downloaded from DBCA website in 2020, Department of Parks and Wildlife, Western Australia.

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

Department of the Environment (2014). *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool [WWW Document]. Retrieved from http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected.

Department of the Environment (2016). EPBC Act referral guideline for the endangered northern quoll, *Dasyurus hallucatus*. EPBC Act policy statement, January 2016, Department of the Environment, Commonwealth of Australia.

DEWHA (2010a). Survey Guidelines for Australia's Threatened Birds. Department of Sustainability, Environment, Water, Population and Communities.

DEWHA (2010b). Survey guidelines for Australia's threatened bats. Commonwealth of Australia. Retrieved from http://www.environment.gov.au/epbc/publications/pubs/nes-guidelines.pdf.

Dickman, C. R., and R. W. Braithwaite (1992). Postmating mortality of males in the Dasyurid Marsupials, *Dasyurus* and *Parantechinus*. *Journal of Mammalogy* 73:143–147.

DoAWE (2020a). Directory of Important Wetlands in Australia [WWW Document]. Department of Agriculture, Water and the Environment, . Retrieved from http://www.environment.gov.au/topics/water/water-our-environment/wetlands/australian-wetlands-database/directory-important.

DoAWE (2020b). *Liasis olivaceus barroni* - Olive Python (Pilbara subspecies) SPRAT Profile [WWW Document]. Department of Agriculture, Water and the Environment, . Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66699.

Doughty, P., A. M. Bauer, M. Pepper, and J. S. Keogh (2018). Spots before the eyes: revision of the saxicoline geckos of the *Gehyra punctata* species complex in the Pilbara region of Western Australia. *Records of the Western Australian Museum* 33:1–50.

DPIRD (2020a). Western Australian Organism List (WAOL) Declared Pest Database [WWW Document]. Department of Primary Industries and Regional Development, Agriculture and Food Division, . Retrieved from https://www.agric.wa.gov.au/organisms.

DPIRD (2020b). Environmental Weed Risk Assessments [WWW Document]. Department of Primary Industries and Regional Development, Agriculture and Food Division, . Retrieved from https://www.agric.wa.gov.au/rangelands/environmental-weed-risk-assessments.

DSEWPaC (2011). Survey Guidelines for Australia's Threatened Mammals. Department of Sustainability, Environment, Water, Population and Communities, Canberra. Retrieved from http://www.environment.gov.au/epbc/publications/threatened-mammals.html.

DSEWPaC (2012). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions) - States and Territories. Department of Sustainability, Environment, Water, Population and Communities, Canberra. Retrieved from http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra.

Duncan, A., G. B. Baker, and N. Montgomery (1999). The Action Plan for Australian Bats. Environment Australia, Canberra.

Ecoedge (2014). Report of a Level 2 Flora and Vegetation survey at Yoongarillup. Unpublished report prepared for Doral Mineral Sands Pty Ltd, Ecoedge Environmental, Bunbury, Western Australia.

Ecologia (2009). Robertson Range (M52/1034) Vegetation and Flora Report. Unpublished report for FerrAus Ltd, March 2009, Ecologia Environment, Western Australia.

Ecologia (2016). J5 and Bungalbin East Project Flora and Vegetation Assessment. Unpublished report prepared for Polaris Metals Pty Ltd, August 2016, Ecologia Environment, Western Australia.

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

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

EPA (2016c). *Technical Guidance: Terrestrial Fauna Surveys*. Environmental Protection Authority, Western Australia.

EPA (2016d). *Technical Guidance: Sampling Methods for Terrestrial Vertebrate Fauna*. Environmental Protection Authority, Western Australia.

EPA (2016e). *Environmental Factor Guideline: Terrestrial Fauna*. Environmental Protection Authority, Western Australia.

EPA (2020). *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Environmental Protection Authority, Western Australia.

Flannery, T., P. Kendall, and K. Wynn-Moylan (1990). *Australia's Vanishing Mammals Endangered and Extinct Native Species*. RD Press.

Friend, J. A. (1990). Status of bandicoots in Western Australia. Pages 73–84 *in* J. H. Seebeck, P. R. Brown, and R. L. Wallis, editors. *Bandicoots and Bilbies*. Surrey Beatty & Sons in association with Australian Mammal Society, New South Wales. Retrieved June 13, 2012, .

Garnett, S. (2013). *Making Australian threatened species legislation more effective and efficient*. Professional Lecture Series 2, Charles Darwin University. Retrieved from https://www.cdu.edu.au/sites/default/files/Garnett-leaflet.pdf.

GHD (2016). Roy Hill North Realignment, Marble Bar Road SLK 119-142 Biological Assessment. Unpublished report prepared for Main Roads, GHD.

Government of Western Australia (2018). *2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017*. Department of Biodiversity, Conservation and Attractions, Government of Western Australia, Perth, Western Australia.

Halpern Glick Maunsell, Biota, and M.E. Trudgen & Associates (2001). Austeel Biological Survey, Phase I. Unpublished report ES974691A100 prepared for Austeel Pty Ltd, February 2001, Halpern Glick Maunsell with Biota Environmental Sciences and M.E. Trudgen & Associates, Western Australia.

How, R. A., J. Dell, and N. K. Cooper (1991). Vertebrate fauna of the Abydos-Woodstock Reserve, northeast Pilbara. *Records of the Western Australian Museum* Supplement 37:78–125.

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

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

Johnstone, R. E., A. H. Burbidge, and J. C. Darnell (2013). Birds of the Pilbara region, including seas and offshore islands, Western Australia: distribution, status and historical changes. *Records of the Western Australian Museum* Supplement 78:343–441.

Johnstone, R. E., and G. M. Storr (1998). *Handbook of Western Australian Birds Volume I - Non-Passerines (Emu to Dollarbird)*. Western Australian Museum, Perth.

Kealley, L., P. Doughty, M. Pepper, J. S. Keogh, M. Hillyer, and J. Huey (2018). Conspicuously concealed: revision of the arid clade of the *Gehyra variegata* (Gekkonidae) group in Western Australia using an integrative molecular and morphological approach, with the description of five cryptic species. *PeerJ* 6:e5334. doi: 10.7717/peerj.5334.

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

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

Liddle, N. R. (2016). The availability and use of root-dwelling larvae as a food source for the greater bilby, *Macrotis lagotis*, in the fire prone Tanami Desert of the Northern Territory. Charles Darwin University.

McKenzie, N. L., and R. Bullen (2009). The echolocation calls, habitat relationships, foraging niches and communities of Pilbara microbats. *Records of the Western Australian Museum* Supplement 78:123–155.

Menkhorst, P., and F. Knight (2011). *A Field Guide to the Mammals of Australia*, 3rd edition. Oxford University Press, Australia.

Menkhorst, P., D. Rogers, R. Clarke, J. Davies, P. Marsack, and K. Franklin (2017). *The Australian Bird Guide*. CSIRO Publishing.

Minton, C., M. Connor, D. Price, R. Jessop, P. Collins, H. Sitters, C. Hassell, G. Pearson, and D. Rogers (2013). Wader numbers and distribution on Eighty Mile Beach, north-west Australia: baseline counts for the period 1981-2003. *Conservation Science Western Australia* 8:345–366.

Morris, K., J. Woinarski, and K. Aplin (2008). *Leggadina lakedownensis* [WWW Document]. Retrieved June 13, 2012, from http://www.iucnredlist.org/apps/redlist/details/11384/0.

Moseby, K., T. Nano, and R. Southgate (2012). *Tales in the sand: a guide to identifying Australian arid zone fauna using spoor and other signs*. Ecological Horizons Pty Ltd.

Muir, B. G. (1977). Biological Survey of the Western Australian Wheatbelt. Part II: Vegetation and habitat of Bendering Reserve. *Records of the Western Australian Museum* Supplement 3.

Murphy, S., J. Austin, R. Murphy, J. Silcock, L. Joseph, S. Garnett, N. Leseberg, J. Watson, and A. Burbidge (2017). Observations on breeding Night Parrots (*Pezoporus occidentalis*) in western Queensland. *EMU Austral Ornithology* 117:107–113.

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

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

Oakwood, M. (2000). Reproduction and demography of the northern quoll, *Dasyurus hallucatus*, in the lowland savanna of northern Australia. *Australian Journal of Zoology* 48:519–539.

Pavey, C. R., C. E. M. Nano, J. B. Cooper, J. R. Cole, and P. J. McDonald (2011). Habitat use, population dynamics and species identification of mulgara, *Dasycercus blythi* and *D. cristicauda*, in a zone of sympatry in central Australia. *Australian Journal of Zoology* 59:156–169.

Pizzey, G., and F. Knight (2007). *The Field Guide to the Birds of Australia*, 8th edition. Harper Collins Publishers, Sydney.

Plantecology Consulting (2013). Nullagine Iron Ore Joint Venture Project Extension - Level 2 Flora and Vegetation Survey. Unpublished report for BC Iron Ltd, May 2013, Plantecology Consulting, Kingsley, Western Australia.

Rio Tinto, and Biota (2013). Flora and Vegetation Survey for Exploration Drilling at Noreena Downs: AR-11-08091. Unpublished report, April 2013, Rio Tinto and Biota Environmental Sciences, Western Australia.

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

Southgate, R. (2005). The results from animal track sampling in the Western Desert Tanami Project (Coyote and Larranganni Deposits). Unpublished report prepared for Biota Environmental Sciences, Envisage Environmental Services.

Southgate, R., and S. Carthew (2007). Post-fire ephemerals and spinifex-fuelled fires: a decision model for bilby habitat management in the Tanami Desert, Australia. *International Journal of Wildland Fire* 16:741–754.

Southgate, R., M. Dziminski, R. Paltridge, A. Schubert, and G. Gaikhorst (2019). Verifying bilby presence and the systematic sampling of wild populations using sign-based protocol – with notes on aerial and ground survey techniques and asserting absence. *Australian Mammalogy* 41:27–38.

Southgate, R. I. (1990). Distribution and abundance of the greater bilby *Macrotis lagotis* Reid (Marsupialia: Peramelidae). Pages 293–302 *in* J. H. Seebeck, P. R. Brown, and R. L. Wallis, editors. *Bandicoots and Bilbies*. Surrey Beatty & Sons in association with Australian Mammal Society, New South Wales.

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

Stack, G. (2017). Threatened and Priority Ecological Communities Report Form - Field Manual. Report version 1.3 prepared for the Significant Species and Communities Resource Condition Monitoring Project, DEC, August 2017, Department of Environment and Conservation, Species and Communities Branch.

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

Strahan, R. (Ed.) (1995). *The Mammals of Australia*. Reed/Australian Museum.

Terrestrial Ecosystems (2019). Level 1 Fauna Assessment for the Proposed Access Route for a Haul Road for Beatons Creek Mine. Unpublished report prepared for Novo Resources Corp, Version 2, December 2019, Terrestrial Ecosystems, Mt Claremont, WA.

Thorp, J. R., and R. Lynch (2000). The Determination of Weeds of National Significance. Commonwealth of Australia & National Weeds Strategy Executive Committee.

Trudgen, M. E. (1988). A Report on the Flora and Vegetation of the Port Kennedy Area. Unpublished report prepared for Bowman Bishaw and Associates, West Perth, M.E. Trudgen and Associates, Western Australia.

van Dyck, S., and R. Strahan (Eds.) (2008). *The Mammals of Australia*, 3rd edition. Reed New Holland, Sydney.

van Vreeswyk, A. M. E., A. L. Payne, K. A. Leighton, and P. Hennig (2004). *Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia*. Department of Agriculture, South Perth WA.

WA Herbarium (2020). FloraBase - the Western Australian Flora [WWW Document]. Department of Biodiversity, Conservation and Attractions, . Retrieved from http://florabase.dpaw.wa.gov.au/.

Walker, J., and M. S. Hopkins (1990). Vegetation. Page *in* R. C. McDonald, R. F. Isbell, J. G. Speight, J. Walker, and M. S. Hopkins, editors. *Australian Soil and Land Survey - Field Handbook*, 2nd edition.

Wildlife Acoustics (2010). *Song Meter User Manual, Model SM2, with Song Meter SM2BAT 192kHz Stereo or 384kHz Mono Ultrasonic Recorders addendum.*

Wilson, S., and G. Swan (2017). *A Complete Guide to Reptiles of Australia*, 5th edition. New Holland.

Woinarski, J. C. Z., A. A. Burbidge, and P. L. Harrison (2014). *The Action Plan for Australian Mammals 2012*. CSIRO Publishing, Victoria.

Woodgis (2019). Flora and Vegetation of Beatons Creek. Unpublished report prepared for Novo Resources Corp, Draft A, 29 November 2019, Woodgis Environmental Assessment and Management.

Appendix 1

Framework for Conservation Significance Ranking of Species and Communities in WA

A. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities

Species and Communities Branch, Department of Environment and Conservation, December 2010.

1. General Definitions

Ecological Community
A naturally occurring biological assemblage that occurs in a particular type of habitat.

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

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

Possible threatened ecological communities that do not meet survey criteria are added to the Department of Parks and Wildlife's Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

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

Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.

Occurrence: a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

Adequately Surveyed is defined as follows:
"An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts."

Community structure is defined as follows:
"The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage" (e.g. *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of **Modification** and **Destruction** of an ecological community:

Modification: "changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention."

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

Note: Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be bought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising underground watertable away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels.

Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

Threatening processes are defined as follows:
"Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community."

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced micro-organisms; direct human exploitation and disturbance of ecological communities.

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

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

2. Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities

ECOLOGICAL COMMUNITIES

Presumed Totally Destroyed (PD)
An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):

A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or

B) All occurrences recorded within the last 50 years have since been destroyed

Critically Endangered (CR)
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):

   i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);

   ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

   i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);

   ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):

i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);

ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);

ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;

iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.

C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)
An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

3. Definitions and Criteria for Priority Ecological Communities

PRIORITY ECOLOGICAL COMMUNITY LIST
Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities
Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities
Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

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

(ii) 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;

(iii) 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 by domestic and/or feral stock, and inappropriate fire regimes.

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

Priority Four: 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.

(a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

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

Priority Five: 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.

B. Categories for Flora and Fauna Species

1. Western Australian *Biodiversity Conservation Act 2016,* and Priority Species Classification

In Western Australia, 'Threatened', 'Extinct' and 'Specially Protected' fauna and flora species are protected under the *Biodiversity Conservation Act 2016* (the BC Act), making it an offence to take or disturb these species without Ministerial approval. The definition of 'take' is broad, and includes killing, injuring, harvesting or capturing fauna, and gathering, cutting, destroying, harvesting or damaging flora.

Such species are classified within a framework of several categories.

Species of the highest conservation significance are designated as Threatened species and are protected under sections 19(1)(a), 19(1)(b) and 19(1)(c) of the BC Act. Species are listed within one of three categories:

- Critically endangered (CR), Endangered (EN), or Vulnerable (V), representing those species listed in Schedules 1 to 3 respectively of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*.

Presumed extinct species are protected under sections 24 and 25 of the BC Act and are listed in one of two categories:

- Extinct (EX), representing those species listed in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*; or
- Extinct in the wild (EW); there are currently no listed species under this category.

Specially protected species are protected under section 13(1) of the BC Act, and include species of special conservation interest, migratory species, cetaceans, species subject to international agreement, or species otherwise in need of special protection. Of these:

- Migratory species (MI) are those listed under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;
- Species of special conservation interest (conservation dependent fauna) (CD) are those listed under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*; and
- Other specially protected fauna (OS) are those listed under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;

In addition to the species formally designated as protected under the BC Act, the WA Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of 'Priority species'.

Species that appear to be rare or threatened, but for which there is insufficient information to properly evaluate their conservation significance, are assigned to one of three Priority categories (Priority 1 to Priority 3), while species that are adequately known but require regular monitoring are assigned to Priority 4.

Note that of the above classifications, only 'Threatened', 'Extinct' and 'Specially Protected' species have statutory standing. The Priority flora and fauna classifications are employed by the WA DBCA to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status.

Further explanations of the categories is provided in more detail in the following pages.

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

CONSERVATION CODES

For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016.*

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T **Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

2 Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

3 Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

2. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Many of the species that are specially protected at State level are also listed as Threatened species at the Federal level, as one of the Matters of National Environmental Significance (MNES) identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These may be classified as 'critically endangered', 'endangered', 'vulnerable' or 'lower risk', consistent with IUCN categories:

1. **Critically Endangered (CR):** a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
2. **Endangered (EN):** a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
3. **Vulnerable (VU):** a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
4. **Lower Risk (LR):** a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:
    - **Conservation Dependent (CD).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
    - **Near Threatened (NT).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
    - **Least Concern (LC).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

In addition, numerous Migratory species are listed as MNES under the EPBC Act (some of which are also listed as Threatened). Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. The list of migratory species consists of those species listed under the following international conventions:

1. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
2. China-Australia Migratory Bird Agreement (CAMBA);
3. Japan-Australia Migratory Bird Agreement (JAMBA); and,
4. Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Marine species are also protected under the EPBC Act, and are listed to ensure the long-term conservation of the species. Marine species include all Australian sea snakes, seals, crocodiles, dugongs, marine turtles, seahorses and seabirds that naturally occur in the Commonwealth marine area.

Under the terms of the EPBC Act, an action (e.g. a project or development) is required to be referred to the Australian Government Environment Minister for approval if it has, will have, or is likely to have, a significant impact on an MNES. The term 'action' includes projects and developments subsequent to commencement of the Act, however there are a number of exemptions (e.g. projects in Commonwealth areas). According to Department of the Environment (2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

References:

Department of the Environment (2013). Matters of National Environmental Significance - Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Canberra, Australia.

Appendix 2

EPBC Act and NatureMap Database Search Results and Maps of Conservation Significant Species Records in the Study Area

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

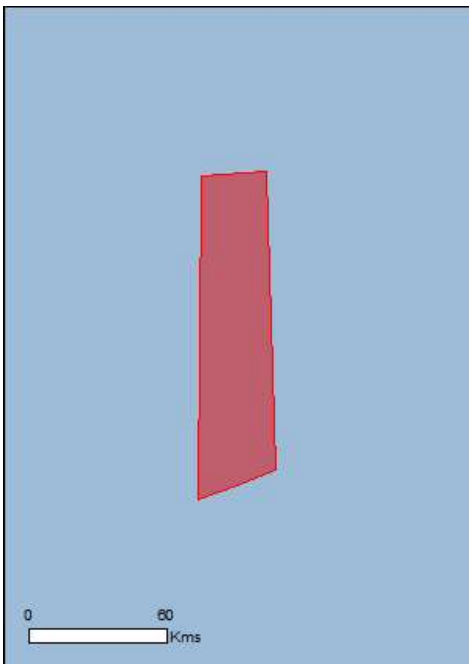
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 18/02/20 16:56:32

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	9
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	13
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Breeding likely to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area
Reptiles		
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Meenthena Station	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Fortescue Marshes	WA

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-21.46667 119.92278,-21.44861 120.17972,-22.53694 120.21306,-22.64139 119.91528,-21.46667 119.92278

Acknowledgements

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

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

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

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

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

NatureMap Species Report - Marble Bar Upgrades North Flora

Created By Guest user on 20/02/2020

Kingdom	Plantae
Conservation Status	Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only	Yes
Core Datasets Only	Yes
Species Group	All Plants
Method	'By Polygon'
Vertices	21° 27' 60" S,119° 55' 22" E 21° 26' 55" S,120° 10' 47" E 21° 59' 34" S,120° 16' 54" E 22° 02' 31" S,119° 58' 54" E
Group By	Conservation Status

Conservation Status	Species	Records
Priority 1	7	78
Priority 2	1	4
Priority 3	4	10
Priority 4	3	9
TOTAL	**15**	**101**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 1					
1.	13073	*Acacia aphanoclada*		P1	
2.	14087	*Acacia cyperophylla var. omearana*		P1	
3.	23522	*Acacia fecunda*		P1	
4.	29995	*Acacia sp. Nullagine (B.R. Maslin 4955)*		P1	Y
5.	2477	*Atriplex spinulosa*		P1	
6.	2767	*Ptilotus wilsonii*		P1	
7.	48446	*Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)*		P1	
Priority 2					
8.	14329	*Indigofera ixocarpa*		P2	
Priority 3					
9.	16730	*Eragrostis crateriformis*		P3	
10.	20264	*Eucalyptus rowleyi*		P3	
11.	11556	*Rostellularia adscendens var. latifolia*		P3	
12.	17820	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*		P3	
Priority 4					
13.	751	*Bulbostylis burbidgeae*		P4	
14.	7530	*Goodenia nuda*		P4	
15.	2744	*Ptilotus mollis*		P4	

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report - Marble Bar Upgrades Central Flora

Created By Guest user on 20/02/2020

Kingdom	Plantae
Conservation Status	Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only	Yes
Core Datasets Only	Yes
Species Group	All Plants
Method	'By Polygon'
Vertices	21° 42' 44" S,120° 04' 43" E 21° 50' 27" S,120° 18' 20" E 22° 20' 35" S,120° 00' 40" E 22° 14' 41" S,119° 45' 49" E
Group By	Conservation Status

Conservation Status	Species	Records
Priority 1	7	74
Priority 2	1	4
Priority 3	4	5
Priority 4	2	2
TOTAL	**14**	**85**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 1					
1.	13073	*Acacia aphanoclada*		P1	
2.	14087	*Acacia cyperophylla var. omearana*		P1	
3.	23522	*Acacia fecunda*		P1	
4.	2477	*Atriplex spinulosa*		P1	
5.	2767	*Ptilotus wilsonii*		P1	
6.	48446	*Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)*		P1	
7.	17296	*Stemodia sp. Battle Hill (A.L. Payne 1006)*		P1	
Priority 2					
8.	14329	*Indigofera ixocarpa*		P2	
Priority 3					
9.	20264	*Eucalyptus rowleyi*		P3	
10.	19594	*Iotasperma sessilifolium*		P3	
11.	19640	*Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)*		P3	
12.	42142	*Swainsona thompsoniana*		P3	
Priority 4					
13.	751	*Bulbostylis burbidgeae*		P4	
14.	2744	*Ptilotus mollis*		P4	

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap Species Report - Marble Bar Upgrades South Flora

Created By Guest user on 20/02/2020

Kingdom	Plantae
Conservation Status	Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only	Yes
Core Datasets Only	Yes
Species Group	All Plants
Method	'By Polygon'
Vertices	22° 03' 09" S,119° 47' 22" E 22° 01' 32" S,120° 04' 30" E 22° 32' 13" S,120° 12' 47" E 22° 38' 29" S,119° 54' 55" E
Group By	Conservation Status

Conservation Status	Species	Records
Priority 1	4	11
Priority 3	6	9
Priority 4	4	6
TOTAL	**14**	**26**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 1					
1.	17363	*Eremophila spongiocarpa*		P1	
2.	44061	*Samolus sp. Fortescue Marsh (A. Markey & R. Coppen FM 9702)*		P1	
3.	17296	*Stemodia sp. Battle Hill (A.L. Payne 1006)*		P1	
4.	38509	*Tecticornia globulifera*		P1	
Priority 3					
5.	31541	*Eragrostis sp. Erect spikelets (P.K. Latz 2122)*		P3	
6.	19594	*Iotasperma sessilifolium*		P3	
7.	19640	*Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)*		P3	
8.	20168	*Rhagodia sp. Hamersley (M. Trudgen 17794)*		P3	
9.	42142	*Swainsona thompsoniana*		P3	
10.	38511	*Tecticornia medusa*		P3	
Priority 4					
11.	751	*Bulbostylis burbidgeae*		P4	
12.	16040	*Eremophila youngii subsp. lepidota*		P4	
13.	7530	*Goodenia nuda*		P4	
14.	2744	*Ptilotus mollis*		P4	

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

1509_10kmNorth_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 21° 32' 34" S,119° 59' 58" E 21° 31' 33" S,120° 08' 11" E 21° 55' 25" S,120° 12' 55" E 21° 57' 26" S,120° 02' 19" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
3.		*Acariformes sp.*			
4.	25536	*Accipiter fasciatus (Brown Goshawk)*			
5.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
6.		*Adelotopus laevis*			
7.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
8.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
9.	25647	*Amytornis striatus (Striated Grasswren)*			
10.	24540	*Amytornis striatus subsp. whitei (Rufous Grasswren)*			
11.		*Aname mellosa*			
12.	24312	*Anas gracilis (Grey Teal)*			
13.	24316	*Anas superciliosa (Pacific Black Duck)*			
14.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
15.	25318	*Antaresia perthensis (Pygmy Python)*			
16.	25448	*Antaresia stimsoni (Stimson's Python)*			
17.	25670	*Anthus australis (Australian Pipit)*			
18.	24285	*Aquila audax (Wedge-tailed Eagle)*			
19.	41324	*Ardea modesta (great egret, white egret)*			
20.	24341	*Ardea pacifica (White-necked Heron)*			
21.	24610	*Ardeotis australis (Australian Bustard)*			
22.		*Areacandona 'iuno' (PSS)*			
23.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
24.	24355	*Artamus minor (Little Woodswallow)*			
25.	24356	*Artamus personatus (Masked Woodswallow)*			
26.	25320	*Aspidites melanocephalus (Black-headed Python)*			
27.		*Australutica sp.1*			
28.	24318	*Aythya australis (Hardhead)*			
29.		*Barnardius zonarius*			
30.		*Bolboleaus trifoveicollis*			
31.	24251	*Bos taurus (European Cattle)*	Y		
32.	25331	*Brachyurophis approximans (North-western Shovel-nosed Snake)*			
33.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
34.	25715	*Cacatua roseicapilla (Galah)*			
35.	25716	*Cacatua sanguinea (Little Corella)*			
36.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
37.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
38.		*Carenum pulchrum*			
39.		*Carenum venustum*			
40.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
41.	25600	*Centropus phasianinus (Pheasant Coucal)*			
42.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
43.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
44.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
45.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
46.		*Chlaenius australis*			
47.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
48.	42311	*Cinclosoma marginatum (Western Quail-thrush)*			
49.	24289	*Circus assimilis (Spotted Harrier)*			
50.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
51.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
52.	24363	*Coracina novaehollandiae subsp. subpallida (Black-faced Cuckoo-shrike)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.	24416	*Corvus bennetti (Little Crow)*			
54.	25593	*Corvus orru (Torresian Crow)*			
55.	25701	*Coturnix ypsilophora (Brown Quail)*			
56.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
57.	25595	*Cracticus tibicen (Australian Magpie)*			
58.	25456	*Crenadactylus ocellatus (Clawless Gecko)*			
59.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
60.	30892	*Cryptoblepharus ustulatus*			
61.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
62.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
63.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
64.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
65.	25036	*Ctenotus duricola*			
66.	25462	*Ctenotus grandis*			
67.	25045	*Ctenotus helenae*			
68.	25052	*Ctenotus leonhardii*			
69.	25058	*Ctenotus nigrilineatus (Pin-striped Fine-snout Skink, Black-lined Ctenotus)*		P1	
70.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
71.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
72.	25072	*Ctenotus rubicundus*			
73.	25071	*Ctenotus rutilans*			
74.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
75.	25074	*Ctenotus schomburgkii*			
76.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
77.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
78.	25375	*Cyclorana maini (Sheep Frog)*			
79.	24322	*Cygnus atratus (Black Swan)*			
80.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
81.	30903	*Dasycercus blythi (Brush-tailed Mulgara, Ampurta)*		P4	
82.	48395	*Dasycercus sp. (mulgara)*		P4	
83.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
84.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
85.	24998	*Delma elegans*			
86.	25001	*Delma nasuta*			
87.	25002	*Delma pax*			
88.	25004	*Delma tincta*			
89.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
90.	25297	*Demansia rufescens (Rufous Whipsnake)*			
91.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
92.		*Diacyclops sobeprolatus*			
93.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
94.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
95.	24940	*Diplodactylus pulcher*			
96.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
97.	24899	*Diporiphora valens (Southern Pilbara Tree Dragon)*			
98.	24470	*Dromaius novaehollandiae (Emu)*			
99.	41406	*Egernia cygnitos (Western Pilbara Spiny-tailed Skink)*			
100.		*Egretta garzetta*			
101.		*Egretta novaehollandiae*			
102.		*Elanus axillaris*			
103.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
104.	24631	*Emblema pictum (Painted Finch)*			
105.		*Eolophus roseicapillus*			
106.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
107.	24570	*Epthianura tricolor (Crimson Chat)*			
108.	24257	*Equus asinus (Donkey)*	Y		
109.	24837	*Eremiornis carteri (Spinifex-bird)*			
110.	24368	*Eurostopodus argus (Spotted Nightjar)*			
111.	25621	*Falco berigora (Brown Falcon)*			
112.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
113.	24473	*Falco hypoleucos (Grey Falcon)*		T	
114.	25623	*Falco longipennis (Australian Hobby)*			
115.	24041	*Felis catus (Cat)*	Y		
116.	25727	*Fulica atra (Eurasian Coot)*			
117.	25301	*Furina ornata (Moon Snake)*			
118.	42314	*Gavicalis virescens (Singing Honeyeater)*			
119.	24956	*Gehyra pilbara*			
120.	24958	*Gehyra punctata*			
121.	24957	*Gehyra purpurascens*			
122.	24959	*Gehyra variegata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	24401	*Geopelia cuneata (Diamond Dove)*			
124.	25585	*Geopelia striata (Zebra Dove)*			
125.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
126.	25530	*Gerygone fusca (Western Gerygone)*			
127.		*Glaphyromorphus sp.*			Y
128.	24443	*Grallina cyanoleuca (Magpie-lark)*			
129.	24295	*Haliastur sphenurus (Whistling Kite)*			
130.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
131.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
132.	47965	*Hieraaetus morphnoides (Little Eagle)*			
133.	25734	*Himantopus himantopus (Black-winged Stilt)*			
134.	24491	*Hirundo neoxena (Welcome Swallow)*			
135.		*Hogna crispipes*			
136.		*Indolpium sp.*			
137.		*Knoelle clara*			
138.	24367	*Lalage tricolor (White-winged Triller)*			
139.		*Lamponina scutata*			
140.		*Lepidiota squamulata*			
141.	25135	*Lerista flammicauda*			
142.	30929	*Lerista jacksoni*			
143.	25155	*Lerista muelleri*			
144.	30925	*Lerista verhmens*			
145.	25005	*Lialis burtonis*			
146.	25486	*Liasis olivaceus (Olive Python)*			
147.	25661	*Lichmera indistincta (Brown Honeyeater)*			
148.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
149.	25392	*Litoria rubella (Little Red Tree Frog)*			
150.	30933	*Lucasium stenodactylum*			
151.	30934	*Lucasium wombeyi*			
152.		*Lychas sp. 2*			
153.		*Lycidas sp. 2*			
154.		*Lycosa gibsoni*			
155.	24180	*Macroderma gigas (Ghost Bat)*		T	
156.	25489	*Macropus robustus (Euro, Biggada)*			
157.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
158.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
159.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
160.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
161.	24549	*Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)*			
162.	24583	*Manorina flavigula (Yellow-throated Miner)*			
163.		*Masasteron tealei*			
164.		*Meedo houstoni*			
165.	47997	*Melanodryas cucullata (Hooded Robin)*			
166.	25665	*Melithreptus gularis (Black-chinned Honeyeater)*			
167.	24736	*Melopsittacus undulatus (Budgerigar)*			
168.	25184	*Menetia greyii*			
169.	25491	*Menetia surda*			
170.	25187	*Menetia surda subsp. surda*			
171.	24598	*Merops ornatus (Rainbow Bee-eater)*			
172.		*Microcarbo melanoleucos*			
173.	25542	*Milvus migrans (Black Kite)*			
174.		*Minasteron minusculum*			
175.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
176.		*Missulena rutraspina*			
177.	25495	*Morethia ruficauda*			
178.	25193	*Morethia ruficauda subsp. exquisita*			
179.	24223	*Mus musculus (House Mouse)*	Y		
180.		*Nematoda sp. 13 (PSS)*			
181.	25685	*Neochmia ruficauda (Star Finch)*			
182.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
183.		*No invertebrates*			
184.	25499	*Notoscincus ornatus*			
185.	25197	*Notoscincus ornatus subsp. ornatus*			
186.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
187.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
188.	24742	*Nymphicus hollandicus (Cockatiel)*			
189.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
190.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
191.		*Onthophagus consentaneus*			
192.		*Onthophagus mjobergi*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	24618	*Oreoica gutturalis (Crested Bellbird)*			
194.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
195.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
196.	25682	*Pardalotus striatus (Striated Pardalote)*			
197.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
198.		*Pellenes bitaeniata*			
199.	48060	*Petrochelidon ariel (Fairy Martin)*			
200.	48061	*Petrochelidon nigricans (Tree Martin)*			
201.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
202.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
203.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
204.	24409	*Phaps chalcoptera (Common Bronzewing)*			
205.		*Pilbarascutigera incola*			
206.	24101	*Planigale ingrami (Long-tailed Planigale)*			
207.	24842	*Platalea regia (Royal Spoonbill)*			
208.	42306	*Platyplectrum spenceri (Centralian Burrowing Frog)*			
209.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
210.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
211.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
212.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
213.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
214.	25199	*Proablepharus reginae*			
215.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
216.	25261	*Pseudechis australis (Mulga Snake)*			
217.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
218.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
219.	24235	*Pseudomys desertor (Desert Mouse)*			
220.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
221.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
222.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
223.	25432	*Pseudophryne douglasi (Gorge Toadlet)*			
224.		*Ptilonorhynchus guttatus*			
225.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
226.	43368	*Rhinonicteris aurantia (Orange Leaf-nosed bat)*		P4	
227.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
228.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
229.	24174	*Saccolaimus flaviventris (Yellow-bellied Sheath-tailed Bat)*			
230.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
231.	30948	*Smicrornis brevirostris (Weebill)*			
232.		*Spinasteron barlee*			
233.	25656	*Stipiturus ruficeps (Rufous-crowned Emu-wren)*			
234.	24927	*Strophurus elderi*			
235.	25269	*Suta fasciata (Rosen's Snake)*			
236.	25307	*Suta punctata (Spotted Snake)*			
237.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
238.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
239.	30870	*Taeniopygia guttata (Zebra Finch)*			
240.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
241.	24176	*Taphozous hilli (Hill's Sheathtail-bat)*			
242.		*Tesserodon novaehollandiae*			
243.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
244.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
245.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
246.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
247.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
248.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
249.	24851	*Turnix velox (Little Button-quail)*			
250.	25439	*Uperoleia glandulosa (Glandular Toadlet)*			
251.	25445	*Uperoleia russelli (Northwest Toadlet)*			
252.		*Urodacus hoplurus*			
253.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
254.	25211	*Varanus caudolineatus*			
255.	25212	*Varanus eremius (Pygmy Desert Monitor)*			
256.	25216	*Varanus giganteus (Perentie)*			
257.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
258.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
259.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
260.	25526	*Varanus tristis (Racehorse Monitor)*			
261.		*Venator yalkara*			
262.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
263.		*Wydundra barrow*			
264.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

1509_10kmCentral_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 21° 48' 30" S,120° 04' 10" E 21° 50' 58" S,120° 11' 54" E 22° 15' 09" S,119° 59' 30" E 22° 11' 33" S,119° 50' 42" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
2.		*Acariformes sp.*			
3.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
4.	25536	*Accipiter fasciatus (Brown Goshawk)*			
5.		*Achnanthes exilis Kütz.*			
6.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
7.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
8.		*Alona clathrata*			
9.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
10.	25647	*Amytornis striatus (Striated Grasswren)*			
11.	24312	*Anas gracilis (Grey Teal)*			
12.	24316	*Anas superciliosa (Pacific Black Duck)*			
13.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
14.		*Anisops canaliculatus*			
15.		*Anisops hackeri*			
16.		*Anopheles annulipes s.l.*			
17.	25318	*Antaresia perthensis (Pygmy Python)*			
18.	25670	*Anthus australis (Australian Pipit)*			
19.		*Antiporus bakewelli*			
20.	24285	*Aquila audax (Wedge-tailed Eagle)*			
21.		*Arcella sp. P1*			
22.	41324	*Ardea modesta (great egret, white egret)*			
23.	24340	*Ardea novaehollandiae (White-faced Heron)*			
24.	24341	*Ardea pacifica (White-necked Heron)*			
25.	24610	*Ardeotis australis (Australian Bustard)*			
26.		*Argiocnemis rubescens*			
27.		*Arrenurus (Arrenurus) ensifer*			
28.		*Arrenurus (Micruracarus) purpureus*			
29.		*Arrenurus sp. 9 (nr pseudaffinis) (PSW)*			
30.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
31.	24355	*Artamus minor (Little Woodswallow)*			
32.	25320	*Aspidites melanocephalus (Black-headed Python)*			
33.		*Australiobates queenslandensis*			
34.		*Austroagrion pindrina/Ischnura heterosticta*			
35.		*Austropeplea lessoni*			
36.		*Axonopsella nr eremita (PSW)*			Y
37.	24318	*Aythya australis (Hardhead)*			
38.		*Barnardius zonarius*			
39.		*Batrachomatus wingi*			
40.		*Bdelloidea sp. 2:2*			
41.		*Berosus dallasae*			
42.		*Berosus nr josephenae (was Pilbara sp 3) (PSW)*			
43.		*Bidessodes denticulatus*			
44.	24251	*Bos taurus (European Cattle)*	Y		
45.		*Brachionus angularis*			
46.		*Brachionus calyciflorus*			
47.		*Brachionus dichotomus*			
48.		*Brachionus falcatus*			
49.		*Brachionus leydigii*			
50.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
51.	25715	*Cacatua roseicapilla (Galah)*			
52.	25716	*Cacatua sanguinea (Little Corella)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
54.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
55.		*Caloneis silicula (Ehr.) Cl.*			
56.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
57.		*Cephalodella gibba*			
58.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
59.		*Chaoborus punctilliger*			
60.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
61.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
62.		*Chydorus eurynotus*			
63.	42311	*Cinclosoma marginatum (Western Quail-thrush)*			
64.	24289	*Circus assimilis (Spotted Harrier)*			
65.		*Cloeon sp. P1 (PSW)*			
66.		*Coelopynia pruinosa*			
67.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
68.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
69.	24363	*Coracina novaehollandiae subsp. subpallida (Black-faced Cuckoo-shrike)*			
70.	24416	*Corvus bennetti (Little Crow)*			
71.	25593	*Corvus orru (Torresian Crow)*			
72.	25701	*Coturnix ypsilophora (Brown Quail)*			
73.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
74.	25595	*Cracticus tibicen (Australian Magpie)*			
75.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
76.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
77.	25036	*Ctenotus duricola*			
78.	25043	*Ctenotus grandis subsp. titan*			
79.	25045	*Ctenotus helenae*			
80.	25058	*Ctenotus nigrilineatus (Pin-striped Fine-snout Skink, Black-lined Ctenotus)*		P1	
81.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
82.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
83.		*Culex sp.*			
84.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
85.	24322	*Cygnus atratus (Black Swan)*			
86.		*Cylotella stelligera Cl. & Grun.*			
87.		*Cypretta sp PSW074*			
88.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
89.	30903	*Dasycercus blythi (Brush-tailed Mulgara, Ampurta)*		P4	
90.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
91.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
92.	24998	*Delma elegans*			
93.	25001	*Delma nasuta*			
94.	25002	*Delma pax*			
95.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
96.		*Dero nivea*			
97.		*Diacyclops humphreysi humphreysi*			
98.		*Diacyclops humphreysi unispinosus*			
99.		*Diatoma vulgaris Bory*			
100.		*Dicrotendipes P5 (=balciunasi?) (PSW)*			
101.		*Dicrotendipes jobetus*			
102.	24940	*Diplodactylus pulcher*			
103.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
104.		*Diplonychus eques*			
105.	24899	*Diporiphora valens (Southern Pilbara Tree Dragon)*			
106.		*Ecnomus pilbarensis*			
107.		*Ecnomus sp. AV16 (PSW)*			
108.		*Ectocyclops phaleratus*			
109.	41406	*Egernia cygnitos (Western Pilbara Spiny-tailed Skink)*			
110.	25094	*Egernia formosa*			
111.		*Egretta garzetta*			
112.		*Egretta novaehollandiae*			
113.		*Elanus axillaris*			
114.		*Elaphoidella humphreysi*			
115.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
116.	24631	*Emblema pictum (Painted Finch)*			
117.		*Enithares sp.*			
118.		*Eodiaptomus lumholtzi*			
119.		*Eolophus roseicapillus*			
120.		*Eosphora najas*			
121.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
122.		*Epithemia smithii Carruthers*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	24570	*Epthianura tricolor (Crimson Chat)*			
124.	24837	*Eremiornis carteri (Spinifex-bird)*			
125.		*Euchlanis dilatata*			
126.		*Eucyclops australiensis*			
127.	24368	*Eurostopodus argus (Spotted Nightjar)*			
128.		*Eurysticta coolawanyah*			
129.	25621	*Falco berigora (Brown Falcon)*			
130.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
131.	24473	*Falco hypoleucos (Grey Falcon)*		T	
132.	25623	*Falco longipennis (Australian Hobby)*			
133.	24041	*Felis catus (Cat)*	Y		
134.		*Filinia cf. pejleri (SAP)*			
135.		*Flosculariidae sp.*			
136.		*Fragilaria ulna (Nitz.) Lange Bertalot*			
137.	25727	*Fulica atra (Eurasian Coot)*			
138.	25301	*Furina ornata (Moon Snake)*			
139.	24956	*Gehyra pilbara*			
140.	24958	*Gehyra punctata*			
141.	24957	*Gehyra purpurascens*			
142.	24959	*Gehyra variegata*			
143.	24401	*Geopelia cuneata (Diamond Dove)*			
144.	25585	*Geopelia striata (Zebra Dove)*			
145.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
146.	25530	*Gerygone fusca (Western Gerygone)*			
147.		*Glaphyromorphus sp.*			Y
148.		*Gomphonema affine Kütz.*			
149.	24443	*Grallina cyanoleuca (Magpie-lark)*			
150.		*Gretacarus sp.*			
151.		*Gyraulus hesperus*			
152.		*Gyrosigma fonticolum Hust. (in Foged)*			
153.		*Halacaridae sp. 1 (PSS)*			
154.	24295	*Haliastur sphenurus (Whistling Kite)*			
155.		*Haliplus pinderi*			
156.		*Hellyethira sp.*			
157.		*Hemicordulia tau*			
158.		*Hemicypris sp. BOS064*			
159.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
160.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
161.	47965	*Hieraaetus morphnoides (Little Eagle)*			
162.	25734	*Himantopus himantopus (Black-winged Stilt)*			
163.		*Hogna crispipes*			
164.		*Hydra sp.*			
165.		*Hydraena barbipes*			
166.		*Hydraena brittoni*			
167.		*Hydraena cf. rudallensis (PSW)*			
168.		*Hydrochus burdekinensis*			
169.		*Hydrochus eurypleuron*			
170.		*Hydrochus group 3 "black" (PSW)*			
171.		*Hydrochus obscuroaeneus*			
172.		*Hydrochus sp. P1 (PSW)*			
173.		*Hydrodroma sp.*			
174.		*Hydroglyphus grammopterus (=trilineatus)*			
175.		*Hydroglyphus leai*			
176.		*Hydroglyphus orthogrammus*			
177.		*Hydrovatus sp.*			
178.		*Hyphydrus lyratus*			
179.		*Ictinogomphus australis*			
180.		*Ilyodromus dikrus*			
181.		*Ilyodromus sp. PB*			
182.		*Ischnura aurora aurora*			
183.		*Isocypris williamsi (ex Ilyodromus sp. 413)*			
184.		*Keratella procurva*			
185.		*Kiefferulus intertinctus*			
186.		*Lanatomyia sp.*			
187.		*Larsia albiceps*			
188.		*Lecane bulla*			
189.		*Lecane unguitata*			
190.		*Lepadella ovalis*			
191.		*Leptocerus atsou*			
192.		*Leptocerus sp. AV2 (atsou?) (PSW)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	30929	*Lerista jacksoni*			
194.		*Leydigia australis*			
195.	25005	*Lialis burtonis*			
196.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
197.	25661	*Lichmera indistincta (Brown Honeyeater)*			
198.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
199.		*Limnesia sp. 4 (PSW)*			
200.		*Limnochares australica*			
201.		*Limnogonus sp.*			
202.	25392	*Litoria rubella (Little Red Tree Frog)*			
203.	30933	*Lucasium stenodactylum*			
204.	30934	*Lucasium wombeyi*			
205.		*Lycosa gibsoni*			
206.		*Macrochaetus altamirai*			
207.	24180	*Macroderma gigas (Ghost Bat)*		T	
208.	25489	*Macropus robustus (Euro, Biggada)*			
209.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
210.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
211.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
212.	24549	*Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)*			
213.	24583	*Manorina flavigula (Yellow-throated Miner)*			
214.		*Masogloia smithii var. lacustris grun.*			Y
215.		*Mastogloia elliptica (Ag.) Cl.*			
216.		*Mastogloia elliptica var. danseii (thwaites) grun.*			
217.		*Mastogloia smithii Thwaites*			
218.	47997	*Melanodryas cucullata (Hooded Robin)*			
219.	24736	*Melopsittacus undulatus (Budgerigar)*			
220.	25187	*Menetia surda subsp. surda*			
221.	24598	*Merops ornatus (Rainbow Bee-eater)*			
222.		*Mesocyclops darwini*			
223.		*Mesovelia hungerfordi*			
224.		*Microcarbo melanoleucos*			
225.		*Microcyclops varicans*			
226.		*Micronecta adelaidae (ex P4)*			
227.		*Micronecta micra*			
228.		*Microvelia (Austromicrovelia) peramoena*			
229.	25542	*Milvus migrans (Black Kite)*			
230.	25495	*Morethia ruficauda*			
231.	24223	*Mus musculus (House Mouse)*	Y		
232.		*Naididae (ex Tubificidae)*			
233.		*Navicula bryophila Petersen*			
234.		*Navicula cryptocephala Kütz.*			
235.		*Navicula cryptonella Lange-Bertalot*			
236.		*Navicula erifuga Lange-Bertalot*			
237.		*Navicula ilopangoensis Hust.*			
238.		*Navicula molestiformis Hust.*			
239.		*Navicula rhynchocephala Kütz.*			
240.		*Navicula subrhynchocephala Hust.*			
241.		*Navicula veneta Kütz.*			
242.		*Necterosoma regulare*			
243.	25685	*Neochmia ruficauda (Star Finch)*			
244.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
245.		*Nitzschia acicularis (Kütz.) W. Sm.*			
246.		*Nitzschia agnita Hust.*			
247.		*Nitzschia amphibia Grun.*			
248.		*Nitzschia compressa var. elongata (grun.) lange-bertalot*			
249.		*Nitzschia frustulum (Kütz.) Grun.*			
250.		*Nitzschia gracilis Hantz.*			
251.		*Nitzschia lanceolata W. Sm.*			Y
252.		*Nitzschia levidensis var. victoriae (grun.) cholnoky*			
		> cholnoky			
		nitzschia levidensis v. victo			
253.		*Nitzschia linearis (Ag.) W. Sm.*			
254.		*Nitzschia microcephala Grun.*			
255.		*Nitzschia palea (Kütz.) W. Sm.*			
256.		*Nitzschia perminuta (Grun.) M. Peragallo*			
257.		*Nitzschia reversa W. Sm.*			
258.		*Nitzschia sigma (Kütz.) W. Sm.*			
259.	25197	*Notoscincus ornatus subsp. ornatus*			
260.	24742	*Nymphicus hollandicus (Cockatiel)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
261.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
262.		*Oecetis sp. Pilbara 5 (PSW)*			
263.		*Onychohydrus sp.*			
264.		*Oribatida group 5 (PSS)*			
265.	48034	*Osphranter robustus (Euro, Biggada)*			
266.		*Oxus orientalis*			
267.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
268.		*Paracladopelma sp. P1 (nr M1) (PSW)*			
269.		*Paracyclops chiltoni*			
270.		*Paracymus pygmaeus*			
271.		*Paracymus spenceri*			
272.		*Paramelitidae sp. 6 (PSS)*			
273.		*Paramelitidae sp. 7 (PSS)*			
274.		*Paramerina sp. D (PSW)*			
275.		*Paranacaena horni*			
276.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
277.	25682	*Pardalotus striatus (Striated Pardalote)*			
278.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
279.	48060	*Petrochelidon ariel (Fairy Martin)*			
280.	48061	*Petrochelidon nigricans (Tree Martin)*			
281.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
282.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
283.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
284.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
285.		*Pinnularia interrupta W. Sm.*			
286.		*Piona cumberlandensis*			
287.	24102	*Planigale maculata (Common Planigale)*			
288.	24842	*Platalea regia (Royal Spoonbill)*			
289.		*Plationus patulus*			
290.	42306	*Platyplectrum spenceri (Centralian Burrowing Frog)*			
291.		*Pleurosigma elongatum W. Sm.*			
292.	25703	*Podargus strigoides (Tawny Frogmouth)*			
293.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
294.		*Polyarthra dolichoptera*			
295.		*Polypedilum leei*			
296.		*Polypedilum nubifer*			
297.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
298.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
299.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
300.		*Pristina longiseta*			
301.	25199	*Proablepharus reginae*			
302.		*Procladius paludicola*			
303.		*Pseudagrion microcephalum*			
304.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
305.	25261	*Pseudechis australis (Mulga Snake)*			
306.		*Pseudectinosoma galassiae*			
307.		*Pseudocloeon hypodelum (ex Baetid genus3 WA sp. 2) (PSW)*			
308.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
309.	24235	*Pseudomys desertor (Desert Mouse)*			
310.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
311.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
312.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
313.		*Ptilonorhynchus guttatus*			
314.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
315.		*Ptygura sp.*			
316.		*Pyralidae Pilbara sp 2 (PSW)*			
317.		*Ranatra diminuta*			
318.		*Recifella sp.*			
319.		*Regimbartia attenuata*			
320.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
321.		*Rhopalodia gibba (Ehr.) O. Mull.)*			
322.		*Scirtidae sp.*			
323.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
324.		*Sellephora pupula (Kütz) Mereschkowsky*			
325.	30948	*Smicrornis brevirostris (Weebill)*			
326.		*Sternopriscus pilbarensis*			
327.		*Stratiomyidae sp.*			
328.	24927	*Strophurus elderi*			
329.	25269	*Suta fasciata (Rosen's Snake)*			
330.	25307	*Suta punctata (Spotted Snake)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
331.		*Synchaeta oblonga*			
332.		*Tabanidae sp.*			
333.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
334.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
335.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
336.	30870	*Taeniopygia guttata (Zebra Finch)*			
337.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
338.		*Tasmanocoenis arcuata*			
339.		*Tasmanocoenis sp. E (PSW)*			
340.		*Testudinella patina*			
341.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
342.		*Tiporus lachlani*			
343.		*Tiporus tambreyi*			
344.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
345.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
346.		*Triaenodes sp. P1=P2 (PSW)*			
347.		*Trichocerca pusilla*			
348.		*Trichocerca similis*			
349.		*Trichocerca sp.*			
350.	24157	*Trichosurus vulpecula subsp. arnhemensis (northern brushtail possum (Kimberley))*		T	
351.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
352.		*Tropocyclops confinis (ex Paracyclops sp. 6)*			
353.	24851	*Turnix velox (Little Button-quail)*			
354.	25762	*Tyto alba (Barn Owl)*			
355.	41428	*Uperoleia saxatilis (Pilbara Toadlet)*			
356.		*Urodacus hoplurus*			
357.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
358.	25211	*Varanus caudolineatus*			
359.	25216	*Varanus giganteus (Perentie)*			
360.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
361.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
362.	25526	*Varanus tristis (Racehorse Monitor)*			
363.		*Venator yalkara*			
364.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
365.		*Vestalenula marmonieri*			
366.		*Zyxomma elgneri*			
367.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

1509_10kmSouth_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 22° 06' 00" S,119° 54' 03" E 22° 07' 59" S,120° 02' 19" E 22° 30' 35" S,120° 07' 06" E 22° 33' 39" S,119° 58' 02" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
3.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
4.	24264	*Acanthiza robustirostris (Slaty-backed Thornbill)*			
5.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
6.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
7.		*Acariformes sp.*			
8.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
9.	25536	*Accipiter fasciatus (Brown Goshawk)*			
10.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
11.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
12.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
13.	25647	*Amytornis striatus (Striated Grasswren)*			
14.		*Aname mellosa*			
15.	24312	*Anas gracilis (Grey Teal)*			
16.	24316	*Anas superciliosa (Pacific Black Duck)*			
17.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
18.	25318	*Antaresia perthensis (Pygmy Python)*			
19.	25670	*Anthus australis (Australian Pipit)*			
20.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
21.	24285	*Aquila audax (Wedge-tailed Eagle)*			
22.	24341	*Ardea pacifica (White-necked Heron)*			
23.	24610	*Ardeotis australis (Australian Bustard)*			
24.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
25.	24355	*Artamus minor (Little Woodswallow)*			
26.	24356	*Artamus personatus (Masked Woodswallow)*			
27.		*Australocyclops sp.*			
28.		*Australutica sp.1*			
29.		*Barnardius zonarius*			
30.	24251	*Bos taurus (European Cattle)*	Y		
31.		*Buddelundia sp.*			
32.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
33.	25715	*Cacatua roseicapilla (Galah)*			
34.	25716	*Cacatua sanguinea (Little Corella)*			
35.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
36.		*Candoninae' (pss)*			
37.		*Carenum pulchrum*			
38.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
39.	25017	*Carlia triacantha (Desert Rainbow Skink)*			
40.	25600	*Centropus phasianinus (Pheasant Coucal)*			
41.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
42.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
43.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
44.	25339	*Chelodina steindachneri (Flat-shelled Turtle)*			
45.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
46.	25580	*Cinclosoma castaneothorax (Chestnut-breasted Quail-thrush)*			
47.	24289	*Circus assimilis (Spotted Harrier)*			
48.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
49.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
50.	24416	*Corvus bennetti (Little Crow)*			
51.	25592	*Corvus coronoides (Australian Raven)*			
52.	25593	*Corvus orru (Torresian Crow)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.	24671	*Coturnix pectoralis (Stubble Quail)*			
54.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
55.	25595	*Cracticus tibicen (Australian Magpie)*			
56.	25596	*Cracticus torquatus (Grey Butcherbird)*			
57.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
58.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
59.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
60.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
61.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
62.	25036	*Ctenotus duricola*			
63.	25044	*Ctenotus hanloni*			
64.	25045	*Ctenotus helenae*			
65.	25052	*Ctenotus leonhardii*			
66.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
67.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
68.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
69.	25465	*Ctenotus uber (Spotted Ctenotus)*			
70.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
71.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
72.	25375	*Cyclorana maini (Sheep Frog)*			
73.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
74.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
75.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
76.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
77.	24997	*Delma butleri*			
78.	25001	*Delma nasuta*			
79.	25002	*Delma pax*			
80.	25004	*Delma tincta*			
81.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
82.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
83.		*Diacyclops humphreysi humphreysi*			
84.		*Diacyclops humphreysi unispinosus*			
85.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
86.	24470	*Dromaius novaehollandiae (Emu)*			
87.		*Ectocyclops phaleratus*			
88.		*Elaphoidella humphreysi*			
89.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
90.	24631	*Emblema pictum (Painted Finch)*			
91.		*Eolophus roseicapillus*			
92.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
93.	24570	*Epthianura tricolor (Crimson Chat)*			
94.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
95.	24837	*Eremiornis carteri (Spinifex-bird)*			
96.	24368	*Eurostopodus argus (Spotted Nightjar)*			
97.	25621	*Falco berigora (Brown Falcon)*			
98.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
99.	24473	*Falco hypoleucos (Grey Falcon)*		T	
100.	25623	*Falco longipennis (Australian Hobby)*			
101.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
102.	24041	*Felis catus (Cat)*	Y		
103.		*Fissarena castanea*			
104.	25301	*Furina ornata (Moon Snake)*			
105.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
106.	42314	*Gavicalis virescens (Singing Honeyeater)*			
107.	24958	*Gehyra punctata*			
108.	24959	*Gehyra variegata*			
109.	24401	*Geopelia cuneata (Diamond Dove)*			
110.	24402	*Geopelia humeralis (Bar-shouldered Dove)*			
111.	25585	*Geopelia striata (Zebra Dove)*			
112.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
113.	25530	*Gerygone fusca (Western Gerygone)*			
114.	24443	*Grallina cyanoleuca (Magpie-lark)*			
115.		*Halacaridae sp. 1 (PSS)*			
116.	24295	*Haliastur sphenurus (Whistling Kite)*			
117.	24297	*Hamirostra melanosternon (Black-breasted Buzzard)*			
118.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
119.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
120.		*Indolpium sp.*			
121.		*Keratella sp.*			
122.	24367	*Lalage tricolor (White-winged Triller)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.		*Lamponina scutata*			
124.	30926	*Lerista amicorum*			
125.	25135	*Lerista flammicauda*			
126.	25146	*Lerista labialis*			
127.	25155	*Lerista muelleri*			
128.	42411	*Lerista timida*			
129.	25005	*Lialis burtonis*			
130.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
131.	25661	*Lichmera indistincta (Brown Honeyeater)*			
132.	25392	*Litoria rubella (Little Red Tree Frog)*			
133.	30933	*Lucasium stenodactylum*			
134.	30934	*Lucasium wombeyi*			
135.		*Lychas sp. 1*			
136.		*Lychas sp. 2*			
137.		*Lycidas sp. 1*			
138.	24180	*Macroderma gigas (Ghost Bat)*		T	
139.	25489	*Macropus robustus (Euro, Biggada)*			
140.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
141.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
142.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
143.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
144.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
145.	24583	*Manorina flavigula (Yellow-throated Miner)*			
146.	47997	*Melanodryas cucullata (Hooded Robin)*			
147.	25665	*Melithreptus gularis (Black-chinned Honeyeater)*			
148.	24736	*Melopsittacus undulatus (Budgerigar)*			
149.	25184	*Menetia greyii*			
150.	25187	*Menetia surda subsp. surda*			
151.	24598	*Merops ornatus (Rainbow Bee-eater)*			
152.		*Mesocyclops brooksi*			
153.		*Microcyclops varicans*			
154.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
155.	25495	*Morethia ruficauda*			
156.	25193	*Morethia ruficauda subsp. exquisita*			
157.	24223	*Mus musculus (House Mouse)*	Y		
158.		*Naididae (ex Tubificidae)*			
159.		*Nematoda sp.*			
160.	25685	*Neochmia ruficauda (Star Finch)*			
161.	24737	*Neophema bourkii (Bourke's Parrot)*			
162.		*Nephila edulis*			
163.	24972	*Nephrurus wheeleri subsp. cinctus*			
164.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
165.		*No invertebrates*			
166.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
167.	24742	*Nymphicus hollandicus (Cockatiel)*			
168.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
169.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
170.		*Onthophagus consentaneus*			
171.		*Onthophagus mjobergi*			
172.		*Onthophagus pugnacior*			
173.		*Onthophagus sloanei*			
174.	24618	*Oreoica gutturalis (Crested Bellbird)*			
175.	34012	*Oreoica gutturalis subsp. pallescens (Crested Bellbird, central)*			
176.		*Ostracoda (unident.)*			
177.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
178.		*Paramelitidae cf. sp. 2 (PSS)*			
179.		*Paramelitidae sp. 6 (PSS)*			
180.		*Paramelitidae sp. 7 (PSS)*			
181.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
182.	25682	*Pardalotus striatus (Striated Pardalote)*			
183.	48060	*Petrochelidon ariel (Fairy Martin)*			
184.	24659	*Petroica goodenovii (Red-capped Robin)*			
185.	24409	*Phaps chalcoptera (Common Bronzewing)*			
186.		*Phorticosomus gularis*			
187.		*Pilbarascutigera incola*			
188.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
189.	25703	*Podargus strigoides (Tawny Frogmouth)*			
190.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
191.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
192.		*Pristina longiseta*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	25199	*Proablepharus reginae*			
194.		*Prodidomus woodleigh*			
195.	25261	*Pseudechis australis (Mulga Snake)*			
196.		*Pseudectinosoma galassiae*			
197.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
198.	24235	*Pseudomys desertor (Desert Mouse)*			
199.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
200.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
201.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
202.	24757	*Ptilonorhynchus maculatus subsp. guttatus (Western Bowerbird)*			
203.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
204.	24278	*Pyrrholaemus brunneus (Redthroat)*			
205.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
206.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
207.		*Rutacarus sp.*			
208.		*Scolopendra laeta*			
209.		*Scolopendra morsitans*			
210.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
211.	30948	*Smicrornis brevirostris (Weebill)*			
212.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
213.		*Spinasteron woodstock*			
214.		*Strandesia 'kimberleyi' (PSS)*			Y
215.	24927	*Strophurus elderi*			
216.	24949	*Strophurus wellingtonae*			
217.		*Stygonitocrella unispinosa*			
218.	25269	*Suta fasciata (Rosen's Snake)*			
219.	25307	*Suta punctata (Spotted Snake)*			
220.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
221.	30870	*Taeniopygia guttata (Zebra Finch)*			
222.		*Tanypodinae sp.*			
223.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
224.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
225.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
226.	24157	*Trichosurus vulpecula subsp. arnhemensis (northern brushtail possum (Kimberley))*		T	
227.	24851	*Turnix velox (Little Button-quail)*			
228.		*Tyrannochthonius aridus*			
229.	25762	*Tyto alba (Barn Owl)*			
230.	25439	*Uperoleia glandulosa (Glandular Toadlet)*			
231.		*Urodacus butleri*			
232.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
233.	25216	*Varanus giganteus (Perentie)*			
234.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
235.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
236.	25526	*Varanus tristis (Racehorse Monitor)*			
237.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
238.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

1509_20kmNorth_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 21° 28' 01" S,119° 55' 23" E 21° 26' 56" S,120° 10' 47" E 21° 59' 35" S,120° 16' 55" E 22° 02' 31" S,119° 58' 54" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
3.		*Acariformes sp.*			
4.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
5.	25536	*Accipiter fasciatus (Brown Goshawk)*			
6.		*Achnanthes exilis Kütz.*			
7.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
8.		*Adelotopus laevis*			
9.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
10.		*Alona clathrata*			
11.	30831	*Amphibolurus gilberti (Ta-ta, Gilbert's Dragon)*			
12.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
13.	25647	*Amytornis striatus (Striated Grasswren)*			
14.	24539	*Amytornis striatus subsp. striatus (Striated Grasswren (inland))*		P4	
15.	24540	*Amytornis striatus subsp. whitei (Rufous Grasswren)*			
16.		*Aname mellosa*			
17.	24312	*Anas gracilis (Grey Teal)*			
18.	24316	*Anas superciliosa (Pacific Black Duck)*			
19.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
20.		*Anisops canaliculatus*			
21.		*Anisops hackeri*			
22.		*Anopheles annulipes s.l.*			
23.	25318	*Antaresia perthensis (Pygmy Python)*			
24.	25448	*Antaresia stimsoni (Stimson's Python)*			
25.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
26.	25670	*Anthus australis (Australian Pipit)*			
27.		*Antiporus bakewelli*			
28.	24285	*Aquila audax (Wedge-tailed Eagle)*			
29.		*Arcella sp. P1*			
30.	41324	*Ardea modesta (great egret, white egret)*			
31.	24340	*Ardea novaehollandiae (White-faced Heron)*			
32.	24341	*Ardea pacifica (White-necked Heron)*			
33.	24610	*Ardeotis australis (Australian Bustard)*			
34.		*Areacandona 'iuno' (PSS)*			
35.		*Argiocnemis rubescens*			
36.		*Arrenurus (Arrenurus) ensifer*			
37.		*Arrenurus (Micruracarus) purpureus*			
38.		*Arrenurus sp. 9 (nr pseudaffinis) (PSW)*			
39.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
40.	24355	*Artamus minor (Little Woodswallow)*			
41.	24356	*Artamus personatus (Masked Woodswallow)*			
42.	25320	*Aspidites melanocephalus (Black-headed Python)*			
43.		*Australiobates queenslandensis*			
44.		*Australutica sp.1*			
45.		*Austroagrion pindrina/Ischnura heterosticta*			
46.		*Austropeplea lessoni*			
47.		*Axonopsella nr eremita (PSW)*			Y
48.	24318	*Aythya australis (Hardhead)*			
49.		*Barnardius zonarius*			
50.		*Batrachomatus wingi*			
51.		*Bdelloidea sp. 2:2*			
52.		*Berosus dallasae*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.		*Berosus nr josephenae (was Pilbara sp 3) (PSW)*			
54.		*Bidessodes denticulatus*			
55.		*Bolboleaus trifoveicollis*			
56.	24251	*Bos taurus (European Cattle)*	Y		
57.		*Brachionus angularis*			
58.		*Brachionus calyciflorus*			
59.		*Brachionus dichotomus*			
60.		*Brachionus falcatus*			
61.		*Brachionus leydigii*			
62.	25331	*Brachyurophis approximans (North-western Shovel-nosed Snake)*			
63.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
64.	25715	*Cacatua roseicapilla (Galah)*			
65.	25716	*Cacatua sanguinea (Little Corella)*			
66.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
67.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
68.		*Caloneis silicula (Ehr.) Cl.*			
69.	24254	*Camelus dromedarius (Dromedary, Camel)*	Y		
70.		*Carenum pulchrum*			
71.		*Carenum venustum*			
72.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
73.		*Cavisternum clavatum*			
74.	25600	*Centropus phasianinus (Pheasant Coucal)*			
75.		*Cephalodella gibba*			
76.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
77.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
78.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
79.		*Chaoborus punctilliger*			
80.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
81.		*Chlaenius australis*			
82.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
83.		*Chydorus eurynotus*			
84.	42311	*Cinclosoma marginatum (Western Quail-thrush)*			
85.	24289	*Circus assimilis (Spotted Harrier)*			
86.		*Cloeon sp. P1 (PSW)*			
87.		*Coelopynia pruinosa*			
88.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
89.		*Conopterum pyripenne*			
90.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
91.	24363	*Coracina novaehollandiae subsp. subpallida (Black-faced Cuckoo-shrike)*			
92.	24416	*Corvus bennetti (Little Crow)*			
93.	25593	*Corvus orru (Torresian Crow)*			
94.	25701	*Coturnix ypsilophora (Brown Quail)*			
95.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
96.	25595	*Cracticus tibicen (Australian Magpie)*			
97.	25456	*Crenadactylus ocellatus (Clawless Gecko)*			
98.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
99.	30892	*Cryptoblepharus ustulatus*			
100.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
101.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
102.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
103.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
104.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
105.	25036	*Ctenotus duricola*			
106.	25462	*Ctenotus grandis*			
107.	25043	*Ctenotus grandis subsp. titan*			
108.	25044	*Ctenotus hanloni*			
109.	25045	*Ctenotus helenae*			
110.	25052	*Ctenotus leonhardii*			
111.	25058	*Ctenotus nigrilineatus (Pin-striped Fine-snout Skink, Black-lined Ctenotus)*		P1	
112.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
113.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
114.	25065	*Ctenotus pantherinus subsp. pantherinus (Leopard Ctenotus)*			
115.	25062	*Ctenotus piankai*			
116.	25072	*Ctenotus rubicundus*			
117.	25071	*Ctenotus rutilans*			
118.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
119.	25074	*Ctenotus schomburgkii*			
120.		*Culex sp.*			
121.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
122.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	25375	*Cyclorana maini (Sheep Frog)*			
124.	25376	*Cyclorana platycephala (Water-holding Frog)*			
125.	24322	*Cygnus atratus (Black Swan)*			
126.		*Cylotella stelligera Cl. & Grun.*			
127.		*Cypretta sp PSW074*			
128.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
129.	30903	*Dasycercus blythi (Brush-tailed Mulgara, Ampurta)*		P4	
130.	48395	*Dasycercus sp. (mulgara)*		P4	
131.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
132.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
133.	24998	*Delma elegans*			
134.	25001	*Delma nasuta*			
135.	25002	*Delma pax*			
136.	25004	*Delma tincta*			
137.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
138.	25297	*Demansia rufescens (Rufous Whipsnake)*			
139.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
140.		*Dero nivea*			
141.		*Diacyclops humphreysi humphreysi*			
142.		*Diacyclops sobeprolatus*			
143.		*Diatoma vulgaris Bory*			
144.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
145.		*Dicrotendipes P5 (=balciunasi?) (PSW)*			
146.		*Dicrotendipes jobetus*			
147.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
148.	24940	*Diplodactylus pulcher*			
149.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
150.		*Diplonychus eques*			
151.	24899	*Diporiphora valens (Southern Pilbara Tree Dragon)*			
152.	24470	*Dromaius novaehollandiae (Emu)*			
153.		*Ecnomus pilbarensis*			
154.		*Ecnomus sp. AV16 (PSW)*			
155.	41406	*Egernia cygnitos (Western Pilbara Spiny-tailed Skink)*			
156.	25094	*Egernia formosa*			
157.		*Egretta garzetta*			
158.		*Egretta novaehollandiae*			
159.		*Elanus axillaris*			
160.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
161.	24631	*Emblema pictum (Painted Finch)*			
162.		*Enithares sp.*			
163.		*Eodiaptomus lumholtzi*			
164.		*Eolophus roseicapillus*			
165.		*Eosphora najas*			
166.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
167.		*Epithemia smithii Carruthers*			
168.	24570	*Epthianura tricolor (Crimson Chat)*			
169.	24257	*Equus asinus (Donkey)*	Y		
170.	24837	*Eremiornis carteri (Spinifex-bird)*			
171.		*Euchlanis dilatata*			
172.		*Eucyclops australiensis*			
173.	24368	*Eurostopodus argus (Spotted Nightjar)*			
174.		*Eurysticta coolawanyah*			
175.	25621	*Falco berigora (Brown Falcon)*			
176.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
177.	24473	*Falco hypoleucos (Grey Falcon)*		T	
178.	25623	*Falco longipennis (Australian Hobby)*			
179.	24041	*Felis catus (Cat)*	Y		
180.		*Filinia cf. pejleri (SAP)*			
181.		*Flosculariidae sp.*			
182.		*Fragilaria ulna (Nitz.) Lange Bertalot*			
183.	25727	*Fulica atra (Eurasian Coot)*			
184.	25301	*Furina ornata (Moon Snake)*			
185.	42314	*Gavicalis virescens (Singing Honeyeater)*			
186.	24956	*Gehyra pilbara*			
187.	24958	*Gehyra punctata*			
188.	24957	*Gehyra purpurascens*			
189.	24959	*Gehyra variegata*			
190.	24401	*Geopelia cuneata (Diamond Dove)*			
191.	25585	*Geopelia striata (Zebra Dove)*			
192.	24404	*Geophaps plumifera (Spinifex Pigeon)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	25530	*Gerygone fusca (Western Gerygone)*			
194.		*Glaphyromorphus sp.*			Y
195.		*Gomphonema affine Kütz.*			
196.	24443	*Grallina cyanoleuca (Magpie-lark)*			
197.		*Gretacarus sp.*			
198.		*Gyraulus hesperus*			
199.		*Gyrosigma fonticolum Hust. (in Foged)*			
200.	24295	*Haliastur sphenurus (Whistling Kite)*			
201.		*Haliplus pinderi*			
202.		*Hellyethira sp.*			
203.		*Hemicordulia tau*			
204.		*Hemicypris sp. BOS064*			
205.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
206.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
207.	47965	*Hieraaetus morphnoides (Little Eagle)*			
208.	25734	*Himantopus himantopus (Black-winged Stilt)*			
209.	24491	*Hirundo neoxena (Welcome Swallow)*			
210.		*Hogna crispipes*			
211.		*Hydra sp.*			
212.		*Hydraena barbipes*			
213.		*Hydraena brittoni*			
214.		*Hydraena cf. rudallensis (PSW)*			
215.		*Hydrochus burdekinensis*			
216.		*Hydrochus eurypleuron*			
217.		*Hydrochus group 3 "black" (PSW)*			
218.		*Hydrochus obscuroaeneus*			
219.		*Hydrochus sp. P1 (PSW)*			
220.		*Hydrodroma sp.*			
221.		*Hydroglyphus grammopterus (=trilineatus)*			
222.		*Hydroglyphus leai*			
223.		*Hydroglyphus orthogrammus*			
224.		*Hydrovatus sp.*			
225.		*Hyphydrus lyratus*			
226.		*Ictinogomphus australis*			
227.		*Ilyodromus dikrus*			
228.		*Ilyodromus sp. PB*			
229.		*Indolpium sp.*			
230.		*Ischnura aurora aurora*			
231.		*Isocypris williamsi (ex Ilyodromus sp. 413)*			
232.		*Keratella procurva*			
233.		*Kiefferulus intertinctus*			
234.		*Knoelle clara*			
235.	24367	*Lalage tricolor (White-winged Triller)*			
236.		*Lamponina scutata*			
237.		*Lanatomyia sp.*			
238.		*Larsia albiceps*			
239.		*Lecane bulla*			
240.		*Lecane unguitata*			
241.		*Lepadella ovalis*			
242.		*Lepidiota squamulata*			
243.		*Leptocerus atsou*			
244.		*Leptocerus sp. AV2 (atsou?) (PSW)*			
245.	25125	*Lerista bipes*			
246.	25135	*Lerista flammicauda*			
247.	30929	*Lerista jacksoni*			
248.	25155	*Lerista muelleri*			
249.	30925	*Lerista verhmens*			
250.		*Leydigia australis*			
251.	25005	*Lialis burtonis*			
252.	25486	*Liasis olivaceus (Olive Python)*			
253.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
254.	25661	*Lichmera indistincta (Brown Honeyeater)*			
255.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
256.		*Limnesia sp. 4 (PSW)*			
257.		*Limnochares australica*			
258.		*Limnogonus sp.*			
259.	25392	*Litoria rubella (Little Red Tree Frog)*			
260.	30933	*Lucasium stenodactylum*			
261.	30934	*Lucasium wombeyi*			
262.		*Lychas sp. 1*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
263.		*Lychas sp. 2*			
264.		*Lycidas sp. 2*			
265.		*Lycosa gibsoni*			
266.		*Macrochaetus altamirai*			
267.	24180	*Macroderma gigas (Ghost Bat)*		T	
268.	25489	*Macropus robustus (Euro, Biggada)*			
269.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
270.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
271.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
272.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
273.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
274.	24549	*Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)*			
275.	24583	*Manorina flavigula (Yellow-throated Miner)*			
276.		*Masasteron tealei*			
277.		*Masogloia smithii var. lacustris grun.*			Y
278.		*Mastogloia elliptica (Ag.) Cl.*			
279.		*Mastogloia elliptica var. danseii (thwaites) grun.*			
280.		*Mastogloia smithii Thwaites*			
281.		*Meedo houstoni*			
282.	47997	*Melanodryas cucullata (Hooded Robin)*			
283.	25665	*Melithreptus gularis (Black-chinned Honeyeater)*			
284.	24589	*Melithreptus gularis subsp. laetior (Black-chinned Honeyeater)*			
285.	24736	*Melopsittacus undulatus (Budgerigar)*			
286.	25184	*Menetia greyii*			
287.	25491	*Menetia surda*			
288.	25187	*Menetia surda subsp. surda*			
289.	24598	*Merops ornatus (Rainbow Bee-eater)*			
290.		*Mesocyclops darwini*			
291.		*Mesovelia hungerfordi*			
292.		*Microcarbo melanoleucos*			
293.		*Microcyclops varicans*			
294.		*Micronecta adelaidae (ex P4)*			
295.		*Micronecta micra*			
296.		*Microvelia (Austromicrovelia) peramoena*			
297.	25542	*Milvus migrans (Black Kite)*			
298.		*Minasteron minusculum*			
299.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
300.		*Missulena rutraspina*			
301.	25495	*Morethia ruficauda*			
302.	25193	*Morethia ruficauda subsp. exquisita*			
303.	24223	*Mus musculus (House Mouse)*	Y		
304.		*Navicula bryophila Petersen*			
305.		*Navicula cryptocephala Kütz.*			
306.		*Navicula cryptonella Lange-Bertalot*			
307.		*Navicula erifuga Lange-Bertalot*			
308.		*Navicula ilopangoensis Hust.*			
309.		*Navicula molestiformis Hust.*			
310.		*Navicula rhynchocephala Kütz.*			
311.		*Navicula subrhynchocephala Hust.*			
312.		*Navicula veneta Kütz.*			
313.		*Necterosoma regulare*			
314.		*Nematoda sp. 13 (PSS)*			
315.	25685	*Neochmia ruficauda (Star Finch)*			
316.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
317.		*Nitzschia acicularis (Kütz.) W. Sm.*			
318.		*Nitzschia agnita Hust.*			
319.		*Nitzschia amphibia Grun.*			
320.		*Nitzschia compressa var. elongata (grun.) lange-bertalot*			
321.		*Nitzschia frustulum (Kütz.) Grun.*			
322.		*Nitzschia gracilis Hantz.*			
323.		*Nitzschia lanceolata W. Sm.*			Y
324.		*Nitzschia levidensis var. victoriae (grun.) cholnoky*			
		> cholnoky			
		nitzschia levidensis v. victo			
325.		*Nitzschia linearis (Ag.) W. Sm.*			
326.		*Nitzschia microcephala Grun.*			
327.		*Nitzschia palea (Kütz.) W. Sm.*			
328.		*Nitzschia perminuta (Grun.) M. Peragallo*			
329.		*Nitzschia reversa W. Sm.*			
330.		*Nitzschia sigma (Kütz.) W. Sm.*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
331.		*No invertebrates*			
332.	25499	*Notoscincus ornatus*			
333.	25197	*Notoscincus ornatus subsp. ornatus*			
334.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
335.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
336.	24742	*Nymphicus hollandicus (Cockatiel)*			
337.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
338.		*Oecetis sp. Pilbara 5 (PSW)*			
339.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
340.		*Onthophagus consentaneus*			
341.		*Onthophagus mjobergi*			
342.		*Onychohydrus sp.*			
343.	24618	*Oreoica gutturalis (Crested Bellbird)*			
344.		*Oribatida group 5 (PSS)*			
345.	48034	*Osphranter robustus (Euro, Biggada)*			
346.		*Oxus orientalis*			
347.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
348.		*Paracladopelma sp. P1 (nr M1) (PSW)*			
349.		*Paracyclops chiltoni*			
350.		*Paracymus pygmaeus*			
351.		*Paracymus spenceri*			
352.		*Paramerina sp. D (PSW)*			
353.		*Paranacaena horni*			
354.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
355.	25682	*Pardalotus striatus (Striated Pardalote)*			
356.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
357.		*Pellenes bitaeniata*			
358.	48060	*Petrochelidon ariel (Fairy Martin)*			
359.	48061	*Petrochelidon nigricans (Tree Martin)*			
360.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
361.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
362.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
363.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
364.	24409	*Phaps chalcoptera (Common Bronzewing)*			
365.		*Phorticosomus gularis*			
366.		*Pilbarascutigera incola*			
367.		*Pinnularia interrupta W. Sm.*			
368.		*Piona cumberlandensis*			
369.	24101	*Planigale ingrami (Long-tailed Planigale)*			
370.	24102	*Planigale maculata (Common Planigale)*			
371.	24842	*Platalea regia (Royal Spoonbill)*			
372.		*Plationus patulus*			
373.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
374.	42306	*Platyplectrum spenceri (Centralian Burrowing Frog)*			
375.		*Pleurosigma elongatum W. Sm.*			
376.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
377.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
378.		*Polyarthra dolichoptera*			
379.		*Polypedilum leei*			
380.		*Polypedilum nubifer*			
381.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
382.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
383.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
384.	25199	*Proablepharus reginae*			
385.		*Procladius paludicola*			
386.		*Prodidomus woodleigh*			
387.		*Pseudagrion microcephalum*			
388.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
389.	25261	*Pseudechis australis (Mulga Snake)*			
390.		*Pseudocloeon hypodelum (ex Baetid genus3 WA sp. 2) (PSW)*			
391.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
392.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
393.	24235	*Pseudomys desertor (Desert Mouse)*			
394.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
395.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
396.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
397.	25432	*Pseudophryne douglasi (Gorge Toadlet)*			
398.		*Ptilonorhynchus guttatus*			
399.	25724	*Ptilonorhynchus maculatus (Spotted Bowerbird)*			
400.	24757	*Ptilonorhynchus maculatus subsp. guttatus (Western Bowerbird)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
401.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
402.		*Ptygura sp.*			
403.		*Pyralidae Pilbara sp 2 (PSW)*			
404.		*Ranatra diminuta*			
405.		*Recifella sp.*			
406.		*Regimbartia attenuata*			
407.	43368	*Rhinonicteris aurantia (Orange Leaf-nosed bat)*		P4	
408.	48095	*Rhinonicteris aurantia (Pilbara) (Pilbara leaf-nosed bat)*		T	
409.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
410.		*Rhopalodia gibba (Ehr.) O. Mull.)*			
411.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
412.	24174	*Saccolaimus flaviventris (Yellow-bellied Sheath-tailed Bat)*			
413.		*Scirtidae sp.*			
414.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
415.		*Sellephora pupula (Kütz) Mereschkowsky*			
416.	30948	*Smicrornis brevirostris (Weebill)*			
417.	24120	*Sminthopsis youngsoni (Lesser Hairy-footed Dunnart)*			
418.		*Spinasteron barlee*			
419.		*Sternopriscus pilbarensis*			
420.	25656	*Stipiturus ruficeps (Rufous-crowned Emu-wren)*			
421.		*Stratiomyidae sp.*			
422.	24927	*Strophurus elderi*			
423.	25269	*Suta fasciata (Rosen's Snake)*			
424.	25307	*Suta punctata (Spotted Snake)*			
425.		*Synchaeta oblonga*			
426.		*Tabanidae sp.*			
427.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
428.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
429.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
430.	30870	*Taeniopygia guttata (Zebra Finch)*			
431.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
432.	24176	*Taphozous hilli (Hill's Sheathtail-bat)*			
433.		*Tasmanocoenis arcuata*			
434.		*Tasmanocoenis sp. E (PSW)*			
435.		*Tesserodon novaehollandiae*			
436.		*Testudinella patina*			
437.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
438.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
439.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
440.		*Tiporus lachlani*			
441.		*Tiporus tambreyi*			
442.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
443.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
444.		*Triaenodes sp. P1=P2 (PSW)*			
445.		*Trichocerca pusilla*			
446.		*Trichocerca similis*			
447.		*Trichocerca sp.*			
448.		*Trichocyclus gnalooma*			
449.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
450.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
451.		*Tropocyclops confinis (ex Paracyclops sp. 6)*			
452.	24851	*Turnix velox (Little Button-quail)*			
453.	25439	*Uperoleia glandulosa (Glandular Toadlet)*			
454.	25445	*Uperoleia russelli (Northwest Toadlet)*			
455.	41428	*Uperoleia saxatilis (Pilbara Toadlet)*			
456.		*Urodacus hoplurus*			
457.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
458.	25210	*Varanus brevicauda (Short-tailed Pygmy Monitor)*			
459.	25211	*Varanus caudolineatus*			
460.	25212	*Varanus eremius (Pygmy Desert Monitor)*			
461.	25216	*Varanus giganteus (Perentie)*			
462.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
463.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
464.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
465.	25526	*Varanus tristis (Racehorse Monitor)*			
466.		*Venator yalkara*			
467.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
468.		*Vestalenula marmonieri*			
469.		*Wydundra barrow*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
470.		*Wydundra kennedy*			
471.		*Zyxomma elgneri*			
472.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

1509_20kmCentral_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 21° 42' 44" S,120° 04' 44" E 21° 50' 27" S,120° 18' 21" E 22° 20' 36" S,120° 00' 40" E 22° 14' 42" S,119° 45' 50" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24264	*Acanthiza robustirostris (Slaty-backed Thornbill)*			
4.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
5.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
6.		*Acariformes sp.*			
7.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
8.	25536	*Accipiter fasciatus (Brown Goshawk)*			
9.		*Achnanthes exilis Kütz.*			
10.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
11.		*Adelotopus laevis*			
12.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
13.		*Alona clathrata*			
14.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
15.	25647	*Amytornis striatus (Striated Grasswren)*			
16.		*Aname mellosa*			
17.	24312	*Anas gracilis (Grey Teal)*			
18.	24316	*Anas superciliosa (Pacific Black Duck)*			
19.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
20.		*Anisops canaliculatus*			
21.		*Anisops hackeri*			
22.		*Anopheles annulipes s.l.*			
23.	25318	*Antaresia perthensis (Pygmy Python)*			
24.	25448	*Antaresia stimsoni (Stimson's Python)*			
25.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
26.	25670	*Anthus australis (Australian Pipit)*			
27.		*Antichiropus sp.*			
28.		*Antiporus bakewelli*			
29.	24285	*Aquila audax (Wedge-tailed Eagle)*			
30.		*Arcella sp. P1*			
31.	41324	*Ardea modesta (great egret, white egret)*			
32.	24340	*Ardea novaehollandiae (White-faced Heron)*			
33.	24341	*Ardea pacifica (White-necked Heron)*			
34.	24610	*Ardeotis australis (Australian Bustard)*			
35.		*Areacandona 'iuno' (PSS)*			
36.		*Argiocnemis rubescens*			
37.		*Arrenurus (Arrenurus) ensifer*			
38.		*Arrenurus (Micruracarus) purpureus*			
39.		*Arrenurus sp. 9 (nr pseudaffinis) (PSW)*			
40.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
41.	24355	*Artamus minor (Little Woodswallow)*			
42.	24356	*Artamus personatus (Masked Woodswallow)*			
43.	25320	*Aspidites melanocephalus (Black-headed Python)*			
44.		*Australiobates queenslandensis*			
45.		*Australocyclops sp.*			
46.		*Australutica sp.1*			
47.		*Austroagrion pindrina/Ischnura heterosticta*			
48.		*Austropeplea lessoni*			
49.		*Axonopsella nr eremita (PSW)*			Y
50.	24318	*Aythya australis (Hardhead)*			
51.		*Barnardius zonarius*			
52.		*Batrachomatus wingi*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.		*Bdelloidea sp. 2:2*			
54.		*Berosus dallasae*			
55.		*Berosus nr josephenae (was Pilbara sp 3) (PSW)*			
56.		*Bidessodes denticulatus*			
57.		*Bolboleaus trifoveicollis*			
58.		*Bolboleaus truncatus*			
59.	24251	*Bos taurus (European Cattle)*	Y		
60.		*Brachionus angularis*			
61.		*Brachionus calyciflorus*			
62.		*Brachionus dichotomus*			
63.		*Brachionus falcatus*			
64.		*Brachionus leydigii*			
65.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
66.	25715	*Cacatua roseicapilla (Galah)*			
67.	25716	*Cacatua sanguinea (Little Corella)*			
68.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
69.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
70.		*Caloneis silicula (Ehr.) Cl.*			
71.	24254	*Camelus dromedarius (Dromedary, Camel)*	Y		
72.		*Candoninae' (pss)*			
73.		*Carenum pulchrum*			
74.		*Carenum venustum*			
75.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
76.	25600	*Centropus phasianinus (Pheasant Coucal)*			
77.		*Cephalodella gibba*			
78.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
79.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
80.		*Chaoborus punctilliger*			
81.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
82.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
83.		*Chydorus eurynotus*			
84.	42311	*Cinclosoma marginatum (Western Quail-thrush)*			
85.	24289	*Circus assimilis (Spotted Harrier)*			
86.		*Cloeon sp. P1 (PSW)*			
87.		*Coelopynia pruinosa*			
88.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
89.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
90.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
91.	24363	*Coracina novaehollandiae subsp. subpallida (Black-faced Cuckoo-shrike)*			
92.		*Cormocephalus turneri*			
93.	24416	*Corvus bennetti (Little Crow)*			
94.	25593	*Corvus orru (Torresian Crow)*			
95.	24671	*Coturnix pectoralis (Stubble Quail)*			
96.	25701	*Coturnix ypsilophora (Brown Quail)*			
97.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
98.	25595	*Cracticus tibicen (Australian Magpie)*			
99.	25596	*Cracticus torquatus (Grey Butcherbird)*			
100.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
101.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
102.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
103.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
104.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
105.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
106.	25036	*Ctenotus duricola*			
107.	25043	*Ctenotus grandis subsp. titan*			
108.	25044	*Ctenotus hanloni*			
109.	25045	*Ctenotus helenae*			
110.	25058	*Ctenotus nigrilineatus (Pin-striped Fine-snout Skink, Black-lined Ctenotus)*		P1	
111.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
112.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
113.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
114.		*Culex sp.*			
115.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
116.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
117.	25375	*Cyclorana maini (Sheep Frog)*			
118.	25376	*Cyclorana platycephala (Water-holding Frog)*			
119.	24322	*Cygnus atratus (Black Swan)*			
120.		*Cylotella stelligera Cl. & Grun.*			
121.		*Cypretta sp PSW074*			
122.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	30903	*Dasycercus blythi (Brush-tailed Mulgara, Ampurta)*		P4	
124.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
125.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
126.	24998	*Delma elegans*			
127.	25001	*Delma nasuta*			
128.	25002	*Delma pax*			
129.	25004	*Delma tincta*			
130.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
131.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
132.		*Dero nivea*			
133.		*Diacyclops humphreysi humphreysi*			
134.		*Diacyclops humphreysi unispinosus*			
135.		*Diacyclops sobeprolatus*			
136.		*Diatoma vulgaris Bory*			
137.		*Dicrotendipes P5 (=balciunasi?) (PSW)*			
138.		*Dicrotendipes jobetus*			
139.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
140.	24940	*Diplodactylus pulcher*			
141.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
142.		*Diplonychus eques*			
143.	24899	*Diporiphora valens (Southern Pilbara Tree Dragon)*			
144.	24470	*Dromaius novaehollandiae (Emu)*			
145.		*Ecnomus pilbarensis*			
146.		*Ecnomus sp. AV16 (PSW)*			
147.		*Ectocyclops phaleratus*			
148.	41406	*Egernia cygnitos (Western Pilbara Spiny-tailed Skink)*			
149.	25094	*Egernia formosa*			
150.		*Egretta garzetta*			
151.		*Egretta novaehollandiae*			
152.		*Elanus axillaris*			
153.		*Elaphoidella humphreysi*			
154.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
155.	24631	*Emblema pictum (Painted Finch)*			
156.		*Enithares sp.*			
157.		*Eodiaptomus lumholtzi*			
158.		*Eolophus roseicapillus*			
159.		*Eosphora najas*			
160.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
161.		*Epithemia smithii Carruthers*			
162.	24570	*Epthianura tricolor (Crimson Chat)*			
163.	24257	*Equus asinus (Donkey)*	Y		
164.	24837	*Eremiornis carteri (Spinifex-bird)*			
165.		*Ethmostigmus curtipes*			
166.		*Euchlanis dilatata*			
167.		*Eucyclops australiensis*			
168.	24368	*Eurostopodus argus (Spotted Nightjar)*			
169.		*Eurysticta coolawanyah*			
170.	25621	*Falco berigora (Brown Falcon)*			
171.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
172.	24473	*Falco hypoleucos (Grey Falcon)*		T	
173.	25623	*Falco longipennis (Australian Hobby)*			
174.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
175.	24041	*Felis catus (Cat)*	Y		
176.		*Filinia cf. pejleri (SAP)*			
177.		*Flosculariidae sp.*			
178.		*Fragilaria ulna (Nitz.) Lange Bertalot*			
179.	25727	*Fulica atra (Eurasian Coot)*			
180.	25301	*Furina ornata (Moon Snake)*			
181.	42314	*Gavicalis virescens (Singing Honeyeater)*			
182.	24956	*Gehyra pilbara*			
183.	24958	*Gehyra punctata*			
184.	24957	*Gehyra purpurascens*			
185.	24959	*Gehyra variegata*			
186.	24401	*Geopelia cuneata (Diamond Dove)*			
187.	25585	*Geopelia striata (Zebra Dove)*			
188.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
189.	25530	*Gerygone fusca (Western Gerygone)*			
190.		*Glaphyromorphus sp.*			Y
191.		*Gomphonema affine Kütz.*			
192.	24443	*Grallina cyanoleuca (Magpie-lark)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.		*Gretacarus sp.*			
194.		*Guineaxonopsis sp.*			
195.		*Gyraulus hesperus*			
196.		*Gyrosigma fonticolum Hust. (in Foged)*			
197.		*Halacaridae sp. 1 (PSS)*			
198.	24295	*Haliastur sphenurus (Whistling Kite)*			
199.		*Haliplus pinderi*			
200.		*Hellyethira sp.*			
201.		*Hemicordulia tau*			
202.		*Hemicypris sp. BOS064*			
203.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
204.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
205.	47965	*Hieraaetus morphnoides (Little Eagle)*			
206.	25734	*Himantopus himantopus (Black-winged Stilt)*			
207.		*Hogna crispipes*			
208.		*Hydra sp.*			
209.		*Hydraena barbipes*			
210.		*Hydraena brittoni*			
211.		*Hydraena cf. rudallensis (PSW)*			
212.		*Hydrochus burdekinensis*			
213.		*Hydrochus eurypleuron*			
214.		*Hydrochus group 3 "black" (PSW)*			
215.		*Hydrochus obscuroaeneus*			
216.		*Hydrochus sp. P1 (PSW)*			
217.		*Hydrodroma sp.*			
218.		*Hydroglyphus grammopterus (=trilineatus)*			
219.		*Hydroglyphus leai*			
220.		*Hydroglyphus orthogrammus*			
221.		*Hydrovatus sp.*			
222.		*Hyphydrus lyratus*			
223.		*Ictinogomphus australis*			
224.		*Ilyodromus dikrus*			
225.		*Ilyodromus sp. PB*			
226.		*Indolpium sp.*			
227.		*Irileka iridescens*			
228.		*Ischnura aurora aurora*			
229.		*Isocypris williamsi (ex Ilyodromus sp. 413)*			
230.		*Keratella procurva*			
231.		*Keratella sp.*			
232.		*Kiefferulus intertinctus*			
233.	24367	*Lalage tricolor (White-winged Triller)*			
234.		*Lamponina scutata*			
235.		*Lanatomyia sp.*			
236.		*Larsia albiceps*			
237.		*Lecane bulla*			
238.		*Lecane unguitata*			
239.		*Lepadella ovalis*			
240.		*Lepidiota squamulata*			
241.		*Leptocerus atsou*			
242.		*Leptocerus sp. AV2 (atsou?) (PSW)*			
243.	30926	*Lerista amicorum*			
244.	30929	*Lerista jacksoni*			
245.	25146	*Lerista labialis*			
246.	25155	*Lerista muelleri*			
247.	30925	*Lerista verhmens*			
248.		*Leydigia australis*			
249.	25005	*Lialis burtonis*			
250.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
251.	25661	*Lichmera indistincta (Brown Honeyeater)*			
252.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
253.		*Limnesia sp. 4 (PSW)*			
254.		*Limnochares australica*			
255.		*Limnogonus sp.*			
256.	25392	*Litoria rubella (Little Red Tree Frog)*			
257.	30933	*Lucasium stenodactylum*			
258.	30934	*Lucasium wombeyi*			
259.		*Lychas sp. 2*			
260.		*Lycidas sp. 1*			
261.		*Lycosa gibsoni*			
262.		*Macrochaetus altamirai*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
263.	24180	*Macroderma gigas (Ghost Bat)*		T	
264.	25489	*Macropus robustus (Euro, Biggada)*			
265.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
266.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
267.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
268.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
269.	24549	*Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)*			
270.	24583	*Manorina flavigula (Yellow-throated Miner)*			
271.		*Masasteron tealei*			
272.		*Masogloia smithii var. lacustris grun.*			Y
273.		*Mastogloia elliptica (Ag.) Cl.*			
274.		*Mastogloia elliptica var. danseii (thwaites) grun.*			
275.		*Mastogloia smithii Thwaites*			
276.		*Meedo houstoni*			
277.	47997	*Melanodryas cucullata (Hooded Robin)*			
278.	24736	*Melopsittacus undulatus (Budgerigar)*			
279.	25184	*Menetia greyii*			
280.	25491	*Menetia surda*			
281.	25187	*Menetia surda subsp. surda*			
282.	24598	*Merops ornatus (Rainbow Bee-eater)*			
283.		*Mesocyclops brooksi*			
284.		*Mesocyclops darwini*			
285.		*Mesovelia hungerfordi*			
286.		*Microcarbo melanoleucos*			
287.		*Microcyclops varicans*			
288.		*Micronecta adelaidae (ex P4)*			
289.		*Micronecta micra*			
290.		*Microvelia (Austromicrovelia) peramoena*			
291.	25542	*Milvus migrans (Black Kite)*			
292.		*Minasteron minusculum*			
293.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
294.		*Missulena rutraspina*			
295.		*Monopylephorus n. sp. WA29 (ex Pristina WA3) (PSS)*			
296.	25495	*Morethia ruficauda*			
297.	25193	*Morethia ruficauda subsp. exquisita*			
298.	24223	*Mus musculus (House Mouse)*	Y		
299.		*Naididae (ex Tubificidae)*			
300.		*Navicula bryophila Petersen*			
301.		*Navicula cryptocephala Kütz.*			
302.		*Navicula cryptonella Lange-Bertalot*			
303.		*Navicula erifuga Lange-Bertalot*			
304.		*Navicula ilopangoensis Hust.*			
305.		*Navicula molestiformis Hust.*			
306.		*Navicula rhynchocephala Kütz.*			
307.		*Navicula subrhynchocephala Hust.*			
308.		*Navicula veneta Kütz.*			
309.		*Necterosoma regulare*			
310.		*Nematoda sp.*			
311.		*Nematoda sp. 13 (PSS)*			
312.	25685	*Neochmia ruficauda (Star Finch)*			
313.	25498	*Nephrurus wheeleri*			
314.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
315.		*Nitzschia acicularis (Kütz.) W. Sm.*			
316.		*Nitzschia agnita Hust.*			
317.		*Nitzschia amphibia Grun.*			
318.		*Nitzschia compressa var. elongata (grun.) lange-bertalot*			
319.		*Nitzschia frustulum (Kütz.) Grun.*			
320.		*Nitzschia gracilis Hantz.*			
321.		*Nitzschia lanceolata W. Sm.*			Y
322.		*Nitzschia levidensis var. victoriae (grun.) cholnoky*			
		> cholnoky			
		nitzschia levidensis v. victo			
323.		*Nitzschia linearis (Ag.) W. Sm.*			
324.		*Nitzschia microcephala Grun.*			
325.		*Nitzschia palea (Kütz.) W. Sm.*			
326.		*Nitzschia perminuta (Grun.) M. Peragallo*			
327.		*Nitzschia reversa W. Sm.*			
328.		*Nitzschia sigma (Kütz.) W. Sm.*			
329.		*No invertebrates*			
330.	25499	*Notoscincus ornatus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
331.	25197	*Notoscincus ornatus subsp. ornatus*			
332.	24742	*Nymphicus hollandicus (Cockatiel)*			
333.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
334.		*Oecetis sp. Pilbara 5 (PSW)*			
335.		*Onthophagus consentaneus*			
336.		*Onthophagus margaretensis*			
337.		*Onthophagus mjobergi*			
338.		*Onychohydrus sp.*			
339.	24618	*Oreoica gutturalis (Crested Bellbird)*			
340.	34012	*Oreoica gutturalis subsp. pallescens (Crested Bellbird, central)*			
341.		*Oribatida group 5 (PSS)*			
342.	48034	*Osphranter robustus (Euro, Biggada)*			
343.		*Ostracoda (unident.)*			
344.		*Oxus orientalis*			
345.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
346.		*Paracladopelma sp. P1 (nr M1) (PSW)*			
347.		*Paracyclops chiltoni*			
348.		*Paracymus pygmaeus*			
349.		*Paracymus spenceri*			
350.		*Paramelitidae cf. sp. 2 (PSS)*			
351.		*Paramelitidae sp. 6 (PSS)*			
352.		*Paramelitidae sp. 7 (PSS)*			
353.		*Paramerina sp. D (PSW)*			
354.		*Paranacaena horni*			
355.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
356.	25682	*Pardalotus striatus (Striated Pardalote)*			
357.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
358.		*Pellenes bitaeniata*			
359.	48060	*Petrochelidon ariel (Fairy Martin)*			
360.	48061	*Petrochelidon nigricans (Tree Martin)*			
361.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
362.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
363.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
364.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
365.	24409	*Phaps chalcoptera (Common Bronzewing)*			
366.		*Phorticosomus gularis*			
367.		*Phreodrilid with dissimilar ventral chaetae*			
368.		*Pilbarascutigera incola*			
369.		*Pinnularia interurupta W. Sm.*			
370.		*Piona cumberlandensis*			
371.	24101	*Planigale ingrami (Long-tailed Planigale)*			
372.	24102	*Planigale maculata (Common Planigale)*			
373.	24842	*Platalea regia (Royal Spoonbill)*			
374.		*Plationus patulus*			
375.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
376.	42306	*Platyplectrum spenceri (Centralian Burrowing Frog)*			
377.		*Pleurosigma elongatum W. Sm.*			
378.	25703	*Podargus strigoides (Tawny Frogmouth)*			
379.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
380.		*Polyarthra dolichoptera*			
381.		*Polypedilum leei*			
382.		*Polypedilum nubifer*			
383.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
384.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
385.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
386.		*Pristina longiseta*			
387.	25199	*Proablepharus reginae*			
388.		*Procladius paludicola*			
389.		*Prodidomus woodleigh*			
390.		*Pseudagrion microcephalum*			
391.	24105	*Pseudantechinus roryi (Rory's Pseudantechinus)*			
392.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
393.	25261	*Pseudechis australis (Mulga Snake)*			
394.		*Pseudectinosoma galassiae*			
395.		*Pseudocloeon hypodelum (ex Baetid genus3 WA sp. 2) (PSW)*			
396.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
397.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
398.	24235	*Pseudomys desertor (Desert Mouse)*			
399.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
400.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
401.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
402.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
403.		*Ptilonorhynchus guttatus*			
404.	24757	*Ptilonorhynchus maculatus subsp. guttatus (Western Bowerbird)*			
405.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
406.		*Ptygura sp.*			
407.	25009	*Pygopus nigriceps*			
408.		*Pyralidae Pilbara sp 2 (PSW)*			
409.		*Ranatra diminuta*			
410.		*Recifella sp.*			
411.		*Regimbartia attenuata*			
412.	43368	*Rhinonicteris aurantia (Orange Leaf-nosed bat)*		P4	
413.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
414.		*Rhopalodia gibba (Ehr.) O. Mull.)*			
415.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
416.		*Rutacarus sp.*			
417.		*Scirtidae sp.*			
418.		*Scolopendra laeta*			
419.		*Scolopendra morsitans*			
420.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
421.		*Sellephora pupula (Kütz) Mereschkowsky*			
422.	30948	*Smicrornis brevirostris (Weebill)*			
423.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
424.		*Spinasteron barlee*			
425.		*Spinasteron woodstock*			
426.		*Sternopriscus pilbarensis*			
427.		*Strandesia 'kimberleyi' (PSS)*			Y
428.		*Stratiomyidae sp.*			
429.	24927	*Strophurus elderi*			
430.		*Stygonitocrella unispinosa*			
431.	25269	*Suta fasciata (Rosen's Snake)*			
432.	25307	*Suta punctata (Spotted Snake)*			
433.		*Synchaeta oblonga*			
434.		*Tabanidae sp.*			
435.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
436.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
437.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
438.	30870	*Taeniopygia guttata (Zebra Finch)*			
439.		*Tanypodinae sp.*			
440.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
441.		*Tasmanocoenis arcuata*			
442.		*Tasmanocoenis sp. E (PSW)*			
443.		*Teinogenys aurilegulus*			
444.		*Testudinella patina*			
445.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
446.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
447.		*Tiporus lachlani*			
448.		*Tiporus tambreyi*			
449.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
450.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
451.		*Triaenodes sp. P1=P2 (PSW)*			
452.		*Trichocerca pusilla*			
453.		*Trichocerca similis*			
454.		*Trichocerca sp.*			
455.		*Trichocyclus gnalooma*			
456.	24157	*Trichosurus vulpecula subsp. arnhemensis (northern brushtail possum (Kimberley))*		T	
457.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
458.		*Tropocyclops confinis (ex Paracyclops sp. 6)*			
459.		*Tubificidae stygo type 4*			
460.	24851	*Turnix velox (Little Button-quail)*			
461.	25762	*Tyto alba (Barn Owl)*			
462.	25439	*Uperoleia glandulosa (Glandular Toadlet)*			
463.	41428	*Uperoleia saxatilis (Pilbara Toadlet)*			
464.		*Urodacus armatus*			
465.		*Urodacus hoplurus*			
466.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
467.	25210	*Varanus brevicauda (Short-tailed Pygmy Monitor)*			
468.	25211	*Varanus caudolineatus*			
469.	25212	*Varanus eremius (Pygmy Desert Monitor)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
470.	25216	*Varanus giganteus (Perentie)*			
471.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
472.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
473.	25526	*Varanus tristis (Racehorse Monitor)*			
474.		*Venator yalkara*			
475.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
476.		*Vestalenula marmonieri*			
477.		*Wydundra kennedy*			
478.		*Zyxomma elgneri*			
479.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

20kmSouth_AllAnimals

Created By Nathan Beerkens on 17/02/2020

Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Polygon'
Vertices 22° 03' 09" S,119° 47' 23" E 22° 01' 32" S,120° 04' 30" E 22° 32' 14" S,120° 12' 48" E 22° 38' 29" S,119° 54' 56" E

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
3.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
4.	24264	*Acanthiza robustirostris (Slaty-backed Thornbill)*			
5.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
6.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
7.		*Acariformes sp.*			
8.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
9.	25536	*Accipiter fasciatus (Brown Goshawk)*			
10.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
11.		*Adelotopus laevis*			
12.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
13.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
14.	25647	*Amytornis striatus (Striated Grasswren)*			
15.		*Aname mellosa*			
16.	24312	*Anas gracilis (Grey Teal)*			
17.	24316	*Anas superciliosa (Pacific Black Duck)*			
18.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
19.	25318	*Antaresia perthensis (Pygmy Python)*			
20.	25448	*Antaresia stimsoni (Stimson's Python)*			
21.	25670	*Anthus australis (Australian Pipit)*			
22.		*Antichiropus sp.*			
23.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
24.	24285	*Aquila audax (Wedge-tailed Eagle)*			
25.	41324	*Ardea modesta (great egret, white egret)*			
26.	24340	*Ardea novaehollandiae (White-faced Heron)*			
27.	24341	*Ardea pacifica (White-necked Heron)*			
28.	24610	*Ardeotis australis (Australian Bustard)*			
29.		*Argiope protensa*			
30.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
31.	24355	*Artamus minor (Little Woodswallow)*			
32.	24356	*Artamus personatus (Masked Woodswallow)*			
33.		*Arthrorhabdus paucispinus*			
34.	25320	*Aspidites melanocephalus (Black-headed Python)*			
35.		*Australocyclops sp.*			
36.		*Australutica sp.1*			
37.	24318	*Aythya australis (Hardhead)*			
38.		*Barnardius zonarius*			
39.		*Bolboleaus truncatus*			
40.	24251	*Bos taurus (European Cattle)*	Y		
41.	25331	*Brachyurophis approximans (North-western Shovel-nosed Snake)*			
42.		*Buddelundia sp.*			
43.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
44.	25715	*Cacatua roseicapilla (Galah)*			
45.	24725	*Cacatua roseicapilla subsp. assimilis (Galah)*			
46.	25716	*Cacatua sanguinea (Little Corella)*			
47.	24727	*Cacatua sanguinea subsp. westralensis (Little Corella)*			
48.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
49.	24254	*Camelus dromedarius (Dromedary, Camel)*	Y		
50.		*Candoninae' (pss)*			
51.		*Carenum pulchrum*			
52.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
53.	25017	*Carlia triacantha (Desert Rainbow Skink)*			
54.	25600	*Centropus phasianinus (Pheasant Coucal)*			
55.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
56.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
57.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
58.	25339	*Chelodina steindachneri (Flat-shelled Turtle)*			
59.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
60.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
61.	25580	*Cinclosoma castaneothorax (Chestnut-breasted Quail-thrush)*			
62.	24288	*Circus approximans (Swamp Harrier)*			
63.	24289	*Circus assimilis (Spotted Harrier)*			
64.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
65.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
66.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
67.		*Cormocephalus turneri*			
68.	24416	*Corvus bennetti (Little Crow)*			
69.	25592	*Corvus coronoides (Australian Raven)*			
70.	25593	*Corvus orru (Torresian Crow)*			
71.	24418	*Corvus orru subsp. cecilae (Western Crow)*			
72.	24671	*Coturnix pectoralis (Stubble Quail)*			
73.	25701	*Coturnix ypsilophora (Brown Quail)*			
74.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
75.	25595	*Cracticus tibicen (Australian Magpie)*			
76.	25596	*Cracticus torquatus (Grey Butcherbird)*			
77.	24424	*Cracticus torquatus subsp. torquatus (Grey Butcherbird)*			
78.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
79.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
80.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
81.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
82.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
83.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
84.	25036	*Ctenotus duricola*			
85.	25044	*Ctenotus hanloni*			
86.	25045	*Ctenotus helenae*			
87.	25052	*Ctenotus leonhardii*			
88.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			
89.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
90.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
91.	25465	*Ctenotus uber (Spotted Ctenotus)*			
92.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
93.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
94.	25375	*Cyclorana maini (Sheep Frog)*			
95.	25376	*Cyclorana platycephala (Water-holding Frog)*			
96.	25547	*Dacelo leachii (Blue-winged Kookaburra)*			
97.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
98.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
99.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
100.	24997	*Delma butleri*			
101.	24998	*Delma elegans*			
102.	25001	*Delma nasuta*			
103.	25002	*Delma pax*			
104.	25004	*Delma tincta*			
105.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
106.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
107.		*Diacyclops humphreysi humphreysi*			
108.		*Diacyclops humphreysi unispinosus*			
109.		*Diacyclops sp.*			
110.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
111.	24940	*Diplodactylus pulcher*			
112.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
113.	24470	*Dromaius novaehollandiae (Emu)*			
114.		*Ectocyclops phaleratus*			
115.	25094	*Egernia formosa*			
116.		*Egretta novaehollandiae*			
117.	25540	*Elanus caeruleus (Black-shouldered Kite)*			
118.		*Elaphoidella humphreysi*			
119.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
120.	24631	*Emblema pictum (Painted Finch)*			
121.		*Eolophus roseicapillus*			
122.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			

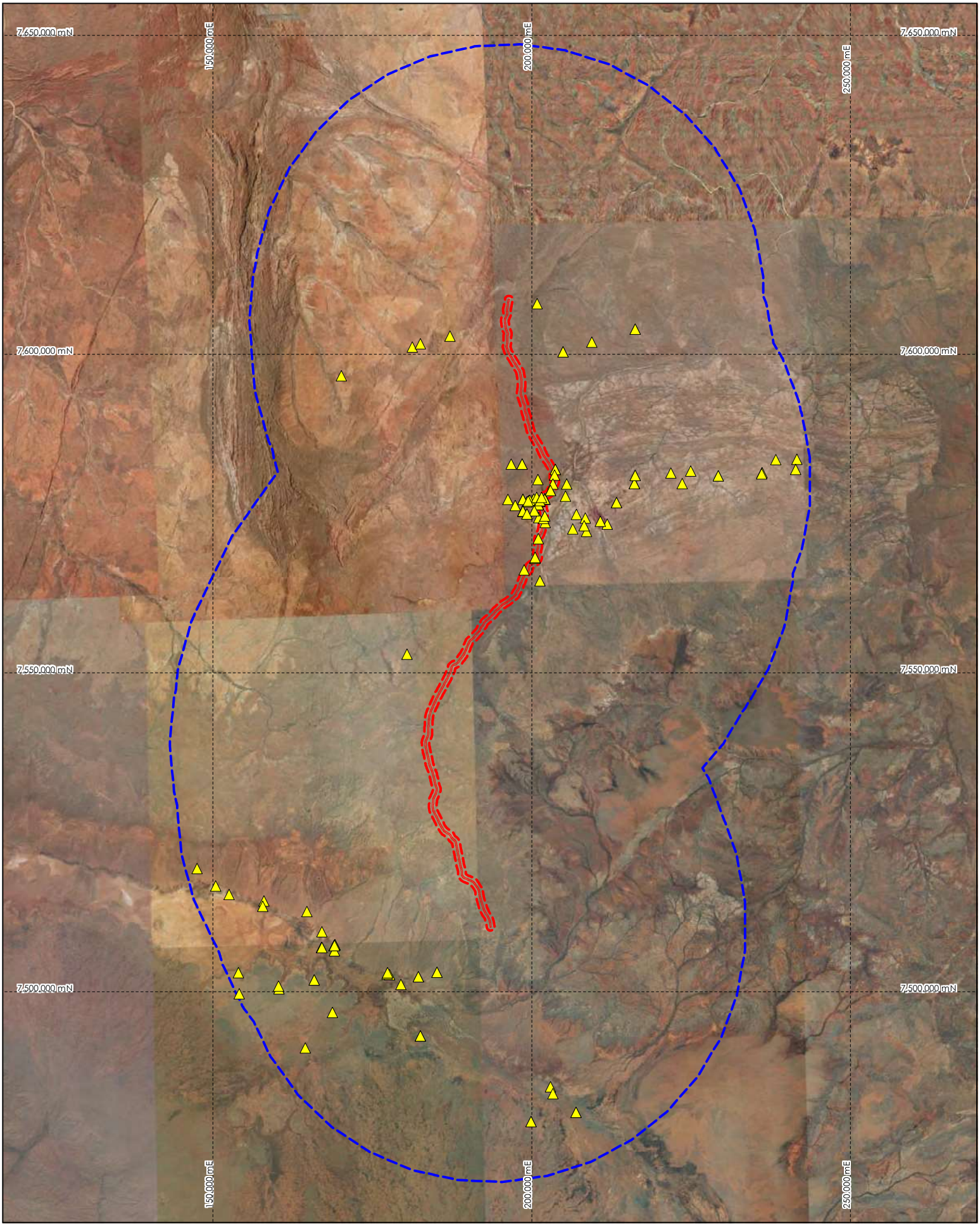
	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
123.	24568	*Epthianura aurifrons (Orange Chat)*			
124.	24570	*Epthianura tricolor (Crimson Chat)*			
125.	24258	*Equus caballus (Horse)*	Y		
126.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
127.	24837	*Eremiornis carteri (Spinifex-bird)*			
128.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
129.		*Ethmostigmus curtipes*			
130.	24368	*Eurostopodus argus (Spotted Nightjar)*			
131.	25621	*Falco berigora (Brown Falcon)*			
132.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
133.	24473	*Falco hypoleucos (Grey Falcon)*		T	
134.	25623	*Falco longipennis (Australian Hobby)*			
135.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
136.	24041	*Felis catus (Cat)*	Y		
137.		*Fissarena castanea*			
138.	25727	*Fulica atra (Eurasian Coot)*			
139.	25301	*Furina ornata (Moon Snake)*			
140.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
141.	42314	*Gavicalis virescens (Singing Honeyeater)*			
142.	24958	*Gehyra punctata*			
143.	24959	*Gehyra variegata*			
144.	47954	*Gelochelidon nilotica (Gull-billed Tern)*		IA	
145.	24401	*Geopelia cuneata (Diamond Dove)*			
146.	24402	*Geopelia humeralis (Bar-shouldered Dove)*			
147.	25585	*Geopelia striata (Zebra Dove)*			
148.	24403	*Geopelia striata subsp. placida (Peaceful Dove)*			
149.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
150.	25530	*Gerygone fusca (Western Gerygone)*			
151.	24443	*Grallina cyanoleuca (Magpie-lark)*			
152.		*Halacaridae sp. 1 (PSS)*			
153.	24295	*Haliastur sphenurus (Whistling Kite)*			
154.	24297	*Hamirostra melanosternon (Black-breasted Buzzard)*			
155.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
156.	24962	*Heteronotia spelea (Desert Cave Gecko, Pilbara Cave Gecko)*			
157.	47965	*Hieraaetus morphnoides (Little Eagle)*			
158.		*Indolpium sp.*			
159.		*Irileka iridescens*			
160.		*Isometroides vescus*			
161.		*Keratella sp.*			
162.	24367	*Lalage tricolor (White-winged Triller)*			
163.		*Lamponina scutata*			
164.	30926	*Lerista amicorum*			
165.	25135	*Lerista flammicauda*			
166.	25146	*Lerista labialis*			
167.	25155	*Lerista muelleri*			
168.	42411	*Lerista timida*			
169.	25005	*Lialis burtonis*			
170.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
171.	25661	*Lichmera indistincta (Brown Honeyeater)*			
172.	25392	*Litoria rubella (Little Red Tree Frog)*			
173.	30933	*Lucasium stenodactylum*			
174.	30934	*Lucasium wombeyi*			
175.		*Lychas sp. 1*			
176.		*Lychas sp. 2*			
177.		*Lycidas sp. 1*			
178.	24180	*Macroderma gigas (Ghost Bat)*		T	
179.	25489	*Macropus robustus (Euro, Biggada)*			
180.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
181.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
182.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
183.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
184.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
185.	24583	*Manorina flavigula (Yellow-throated Miner)*			
186.	47995	*Megalurus mathewsi (Rufous Songlark)*			
187.	47997	*Melanodryas cucullata (Hooded Robin)*			
188.	25665	*Melithreptus gularis (Black-chinned Honeyeater)*			
189.	24736	*Melopsittacus undulatus (Budgerigar)*			
190.	25184	*Menetia greyii*			
191.	25187	*Menetia surda subsp. surda*			
192.	24598	*Merops ornatus (Rainbow Bee-eater)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.		*Mesocyclops brooksi*			
194.		*Microcarbo melanoleucos*			
195.		*Microcyclops varicans*			
196.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
197.		*Missulena rutraspina*			
198.	25495	*Morethia ruficauda*			
199.	25193	*Morethia ruficauda subsp. exquisita*			
200.	24223	*Mus musculus (House Mouse)*	Y		
201.		*Naididae (ex Tubificidae)*			
202.		*Nematoda sp.*			
203.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
204.	25685	*Neochmia ruficauda (Star Finch)*			
205.	24737	*Neophema bourkii (Bourke's Parrot)*			
206.		*Neopsephotus bourkii*			
207.		*Nephila edulis*			
208.	25498	*Nephrurus wheeleri*			
209.	24972	*Nephrurus wheeleri subsp. cinctus*			
210.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
211.		*No invertebrates*			
212.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
213.	24742	*Nymphicus hollandicus (Cockatiel)*			
214.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
215.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
216.		*Oligochaeta sp.*			
217.		*Onthophagus consentaneus*			
218.		*Onthophagus margaretensis*			
219.		*Onthophagus mjobergi*			
220.		*Onthophagus pugnacior*			
221.		*Onthophagus sloanei*			
222.	24618	*Oreoica gutturalis (Crested Bellbird)*			
223.	34012	*Oreoica gutturalis subsp. pallescens (Crested Bellbird, central)*			
224.	48034	*Osphranter robustus (Euro, Biggada)*			
225.		*Ostracoda (unident.)*			
226.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
227.		*Paramelitidae cf. sp. 2 (PSS)*			
228.		*Paramelitidae sp. 6 (PSS)*			
229.		*Paramelitidae sp. 7 (PSS)*			
230.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
231.	25682	*Pardalotus striatus (Striated Pardalote)*			
232.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
233.	48060	*Petrochelidon ariel (Fairy Martin)*			
234.	48061	*Petrochelidon nigricans (Tree Martin)*			
235.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
236.	24659	*Petroica goodenovii (Red-capped Robin)*			
237.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
238.	24409	*Phaps chalcoptera (Common Bronzewing)*			
239.		*Phorticosomus gularis*			
240.		*Phrysonnotus novaehollandiae*			Y
241.		*Pilbarascutigera incola*			
242.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
243.	24842	*Platalea regia (Royal Spoonbill)*			
244.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
245.	25703	*Podargus strigoides (Tawny Frogmouth)*			
246.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
247.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
248.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
249.	25706	*Pomatostomus temporalis (Grey-crowned Babbler)*			
250.	24684	*Pomatostomus temporalis subsp. rubeculus (Grey-crowned Babbler)*			
251.		*Pristina longiseta*			
252.	25199	*Proablepharus reginae*			
253.		*Prodidomus woodleigh*			
254.	25261	*Pseudechis australis (Mulga Snake)*			
255.		*Pseudectinosoma galassiae*			
256.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
257.	24235	*Pseudomys desertor (Desert Mouse)*			
258.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
259.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
260.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
261.		*Ptilonorhynchus guttatus*			
262.	24757	*Ptilonorhynchus maculatus subsp. guttatus (Western Bowerbird)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
263.	42323	*Ptilotula keartlandi (Grey-headed Honeyeater)*			
264.	48088	*Ptilotula penicillata (White-plumed Honeyeater)*			
265.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
266.	25009	*Pygopus nigriceps*			
267.	24278	*Pyrrholaemus brunneus (Redthroat)*			
268.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
269.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
270.		*Rutacarus sp.*			
271.	24174	*Saccolaimus flaviventris (Yellow-bellied Sheath-tailed Bat)*			
272.		*Scolopendra laeta*			
273.		*Scolopendra morsitans*			
274.	24200	*Scotorepens greyii (Little Broad-nosed Bat)*			
275.	30948	*Smicrornis brevirostris (Weebill)*			
276.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
277.	24120	*Sminthopsis youngsoni (Lesser Hairy-footed Dunnart)*			
278.		*Spinasteron waldockae*			
279.		*Spinasteron woodstock*			
280.		*Stenocypris cf. bolieki*			
281.		*Strandesia 'kimberleyi' (PSS)*			Y
282.	24927	*Strophurus elderi*			
283.	24949	*Strophurus wellingtonae*			
284.		*Stygonitocrella unispinosa*			
285.		*Supunna picta*			
286.	25269	*Suta fasciata (Rosen's Snake)*			
287.	25307	*Suta punctata (Spotted Snake)*			
288.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
289.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
290.	30870	*Taeniopygia guttata (Zebra Finch)*			
291.		*Tanypodinae sp.*			
292.		*Teinogenys aurilegulus*			
293.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
294.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
295.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
296.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
297.		*Trachyspina mundaring*			
298.	24157	*Trichosurus vulpecula subsp. arnhemensis (northern brushtail possum (Kimberley))*		T	
299.	24851	*Turnix velox (Little Button-quail)*			
300.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
301.		*Tyrannochthonius aridus*			
302.	25762	*Tyto alba (Barn Owl)*			
303.	25439	*Uperoleia glandulosa (Glandular Toadlet)*			
304.	25445	*Uperoleia russelli (Northwest Toadlet)*			
305.		*Urodacus armatus*			
306.		*Urodacus butleri*			
307.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
308.	25211	*Varanus caudolineatus*			
309.	25216	*Varanus giganteus (Perentie)*			
310.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
311.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
312.	25526	*Varanus tristis (Racehorse Monitor)*			
313.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
314.	24040	*Vulpes vulpes (Red Fox)*	Y		
315.		*Wydundra kennedy*			
316.	24248	*Zyzomys argurus (Common Rock-rat)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



Location Map



Survey area

Contextual area

Study area

Priority 1 flora record

N

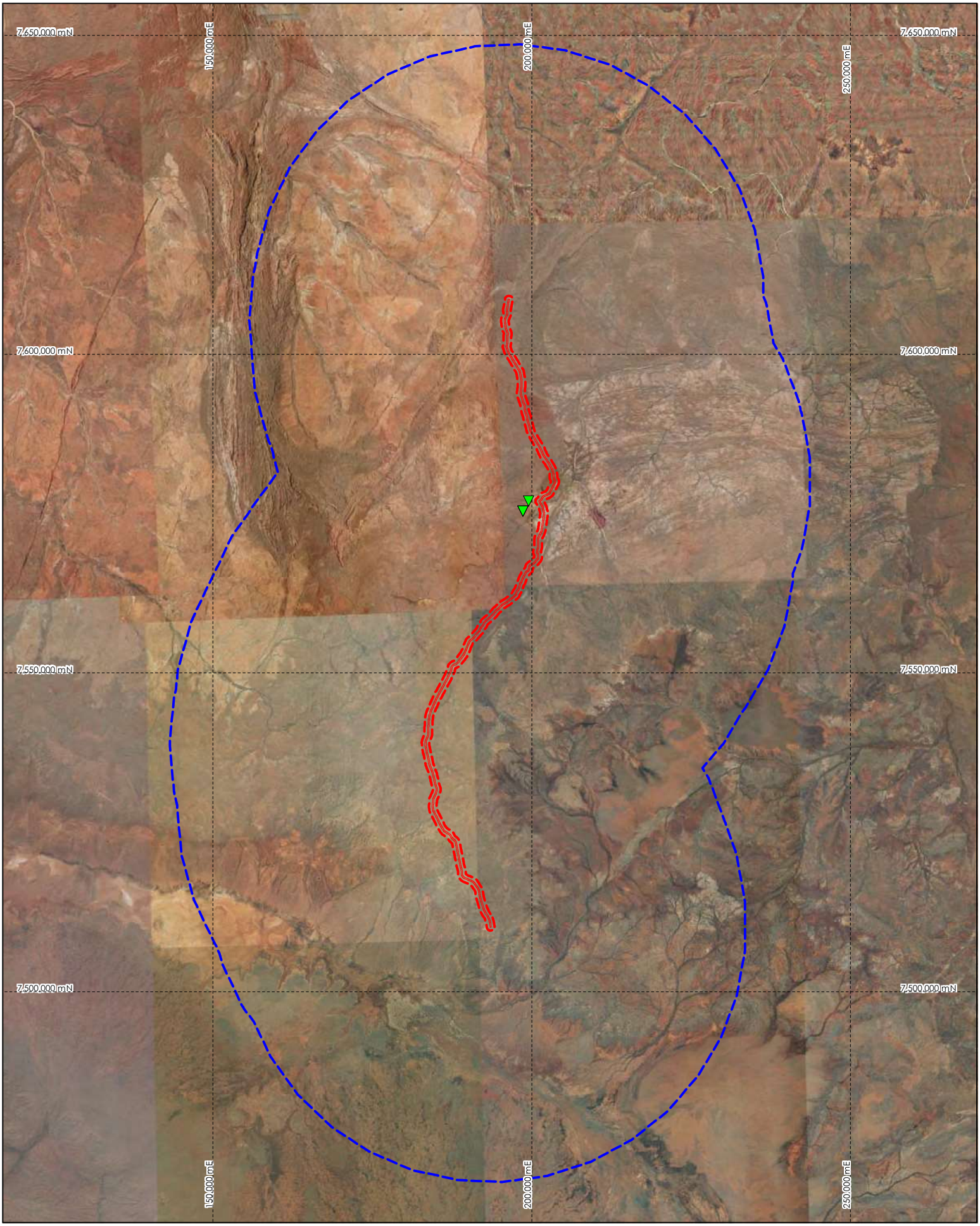
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Priority Flora Map 1

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

Priority 2 flora record

N

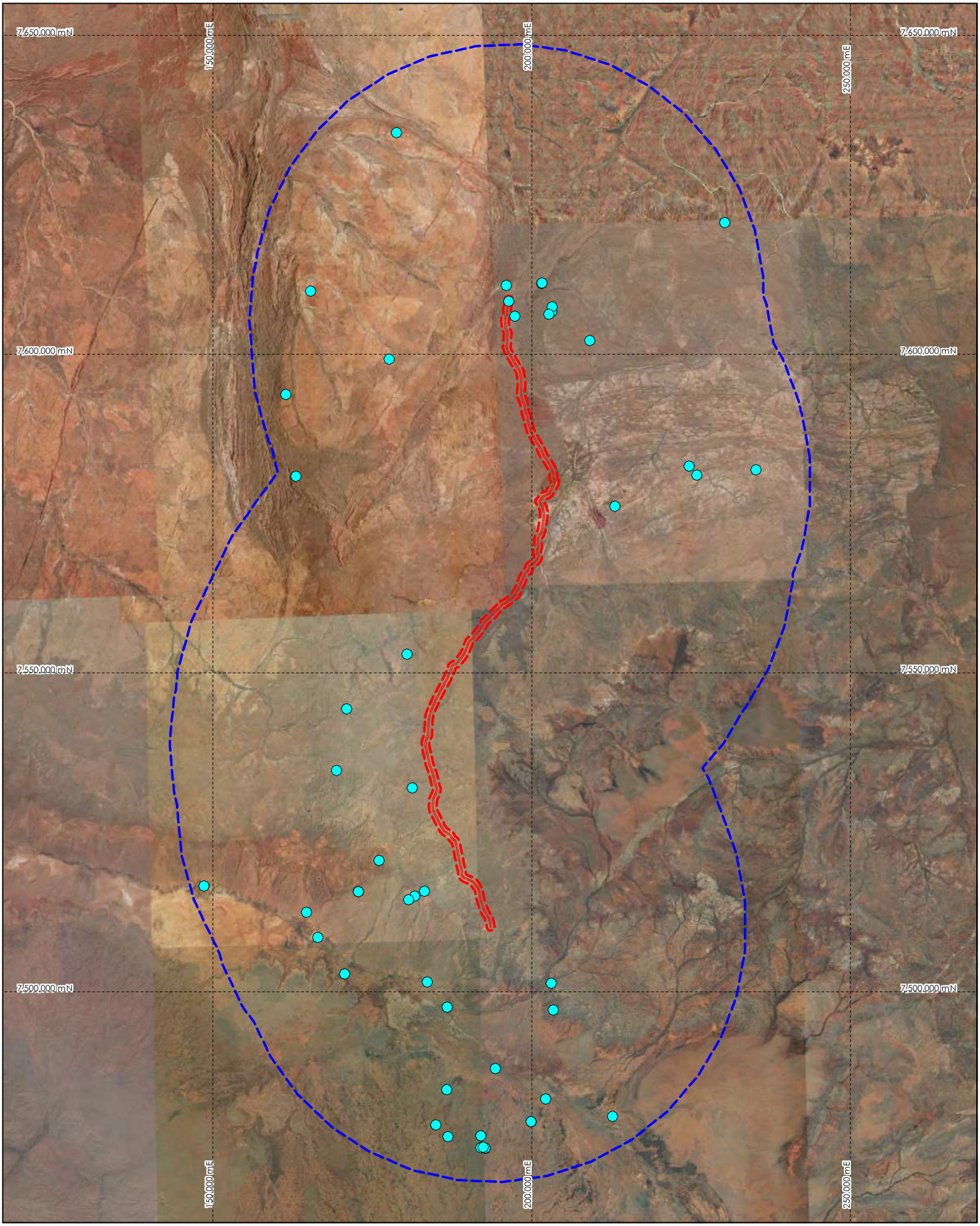
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Priority Flora Map 2

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

Priority 3 flora record

N

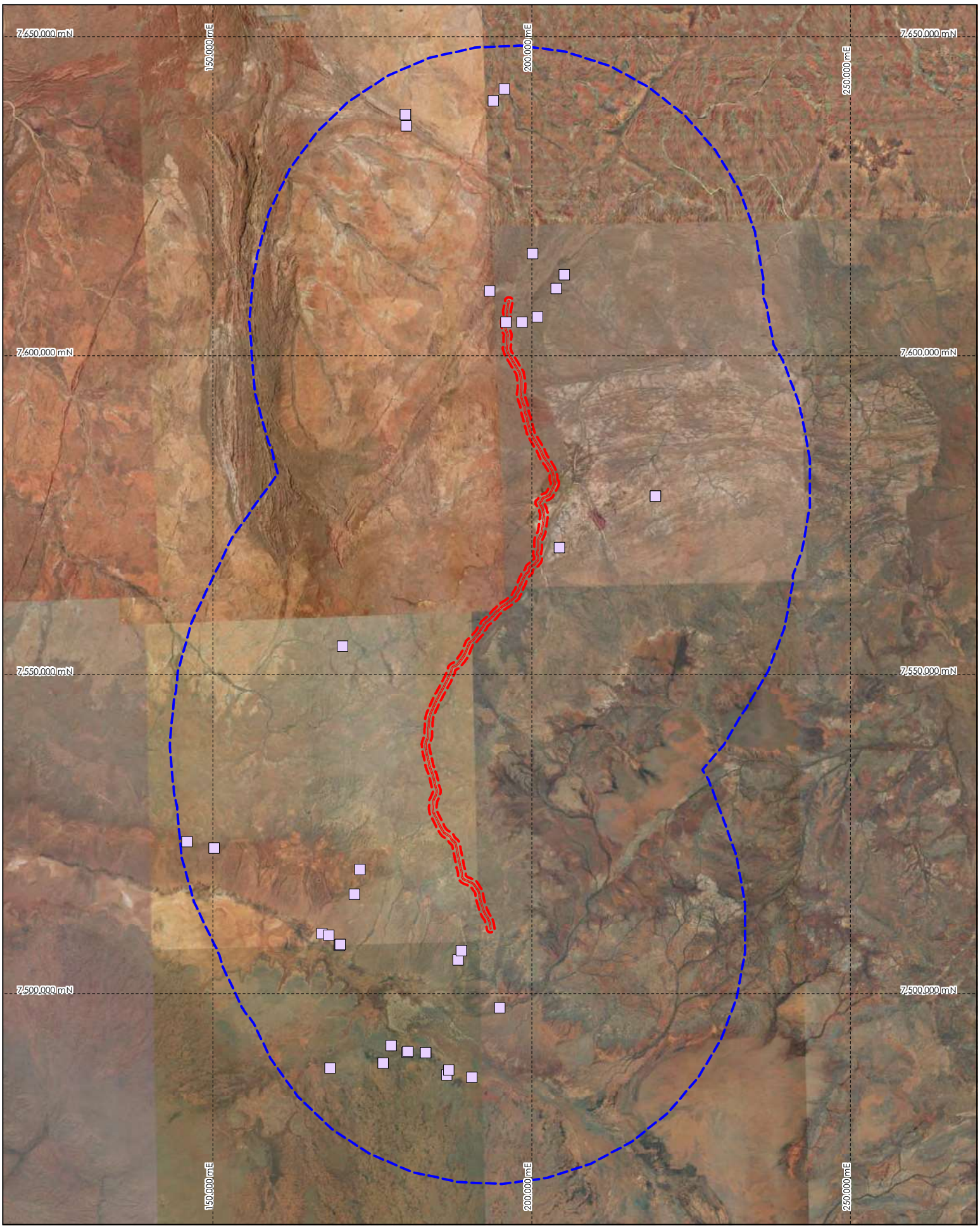
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Priority Flora Map 3

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

Priority 4 flora record

N

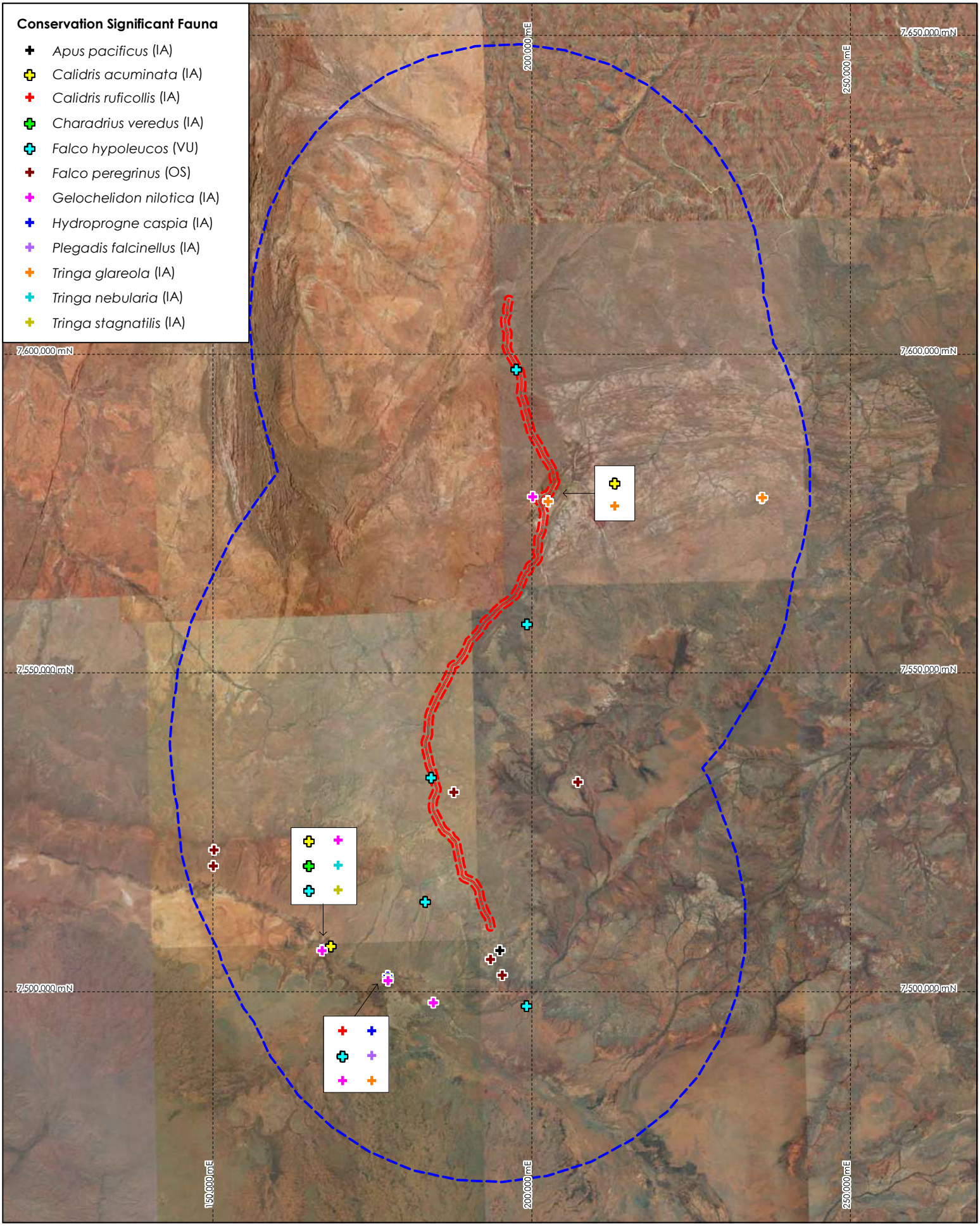
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Priority Flora Map 4

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

N

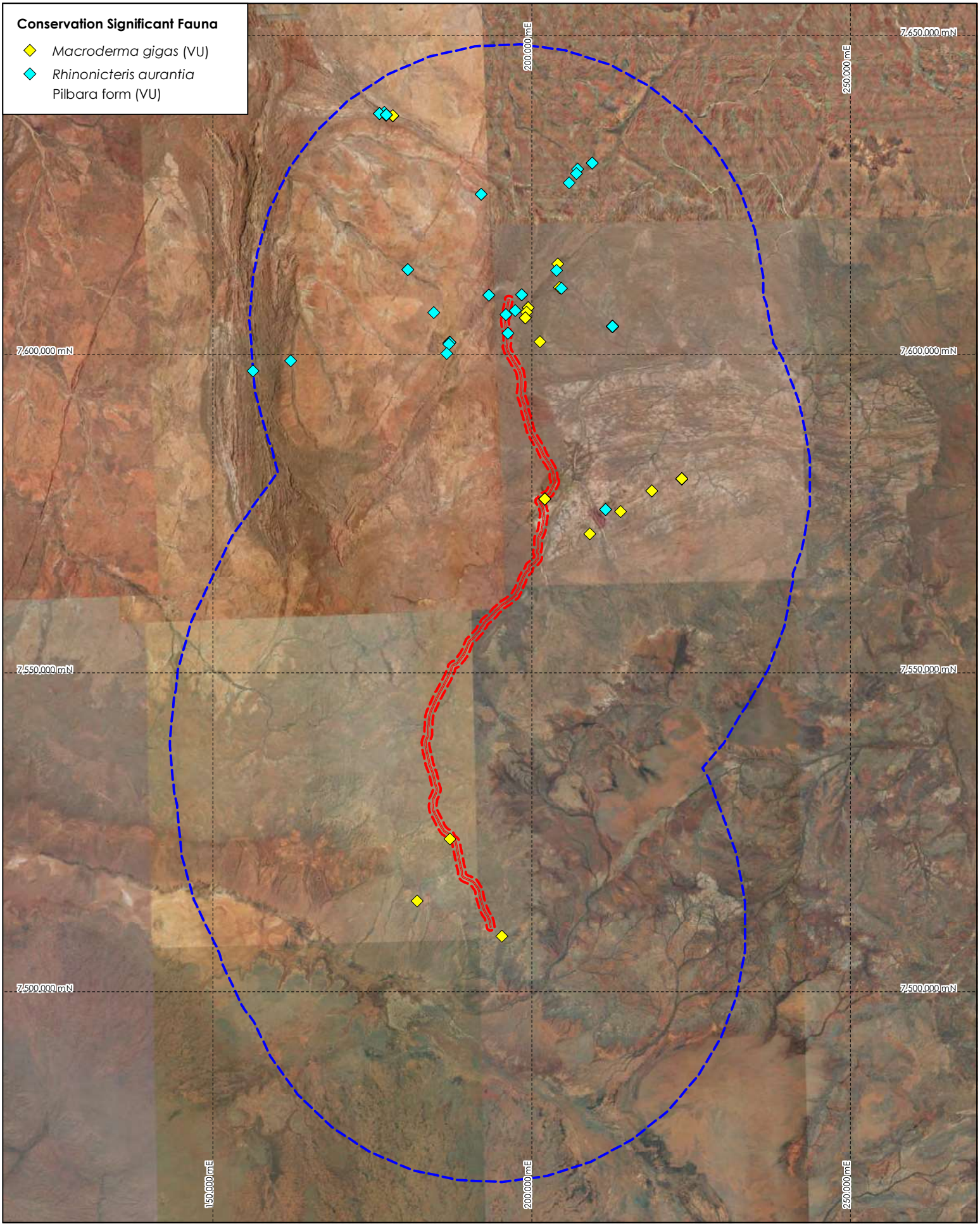
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Conservation Significant Fauna (Birds) Map 1

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

N

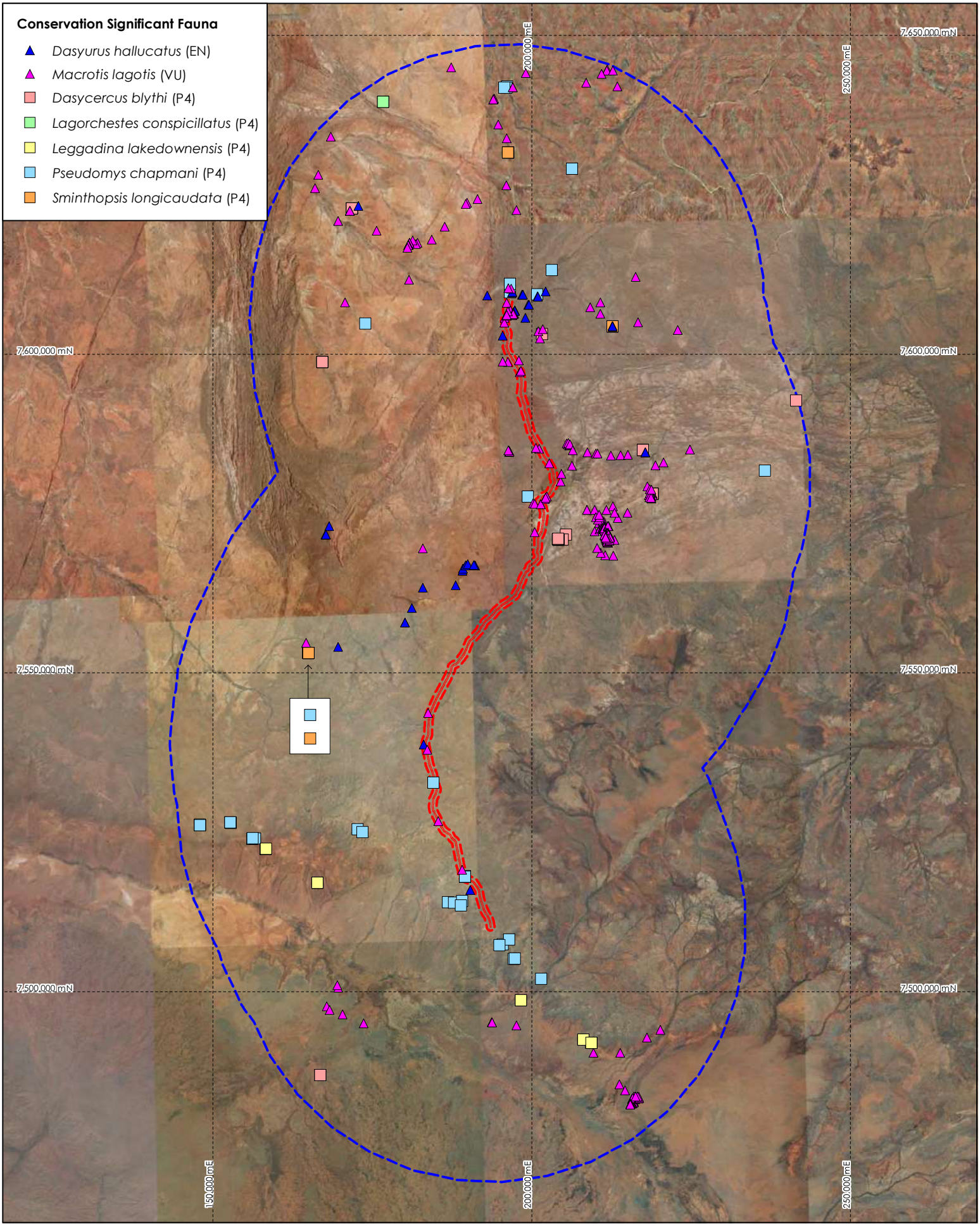
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Conservation Significant Fauna (Bats) Map 2

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

N

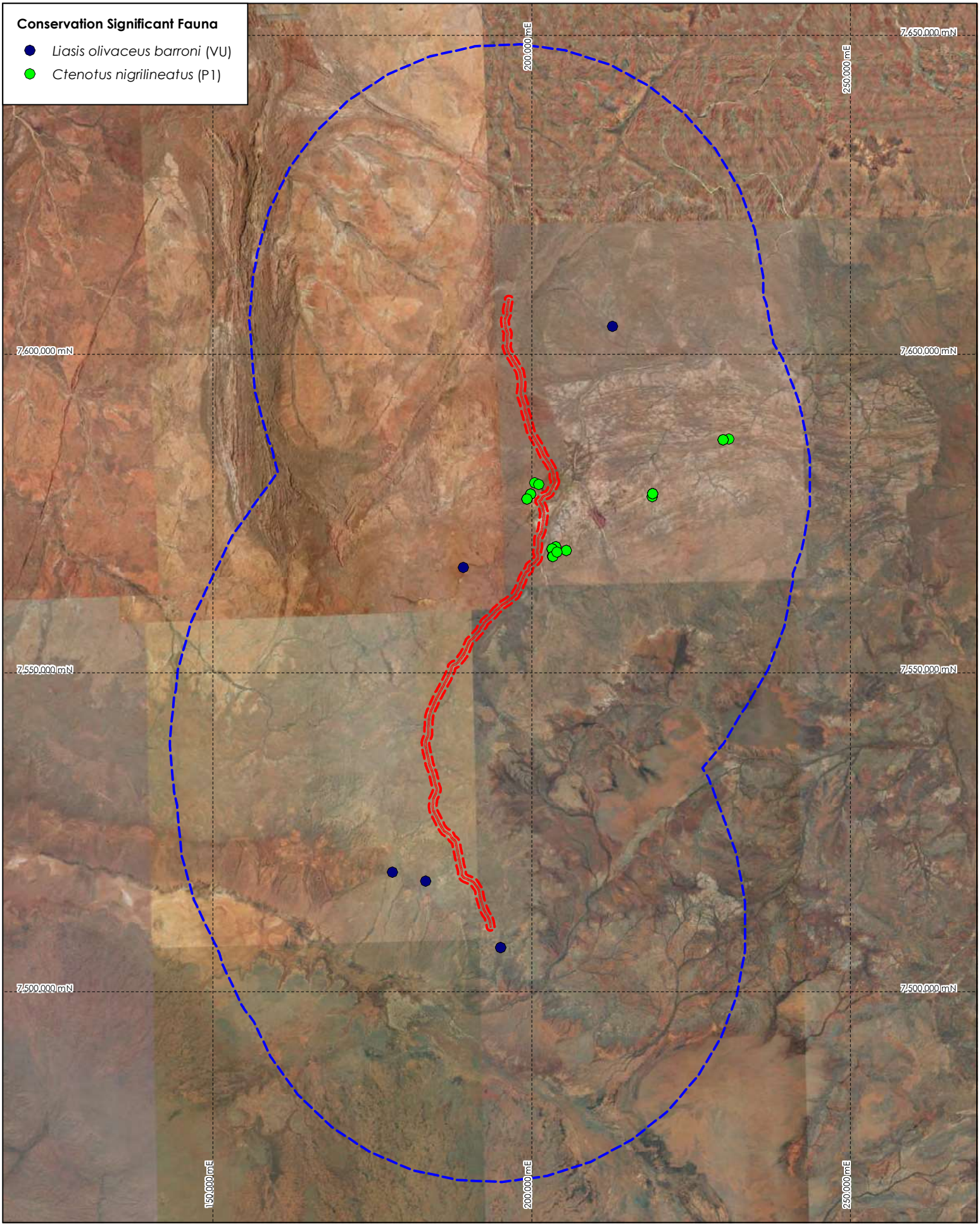
0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Conservation Significant Fauna (Mammals) Map 3

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000



Location Map



Survey area

Contextual area

Study area

N

0 15 30

kilometres

Marble Bar Road Upgrade
Previously Recorded Conservation Significant Fauna (Reptiles) Map 4

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 08 Feb 2021 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:750,000

Appendix 3

Likelihood of Occurrence of Flora of Conservation Significance

Taxon	Habit (WA Herbarium 2020)	Habitat (WA Herbarium 2020)	Databases			Previous Surveys			Likelihood of Occurrence in the Survey Area	
			Nature Map	DBCA TPFL	WA Herbarium	Astron 2014	GHD 2016	WoodGIS 2019	Initial Ranking Based on Desktop Review	Final Ranking Including Results of 2020 Field Survey
Priority 1										
Acacia aphanoclada	Slender, wispy shrub to 5 m tall.	Skeletal stony soils on rocky hills, ridges and rises.	✓	✓	✓	✓		✓	**Recorded**: numerous existing records from the locality between 33.6 km N, 9.6 km S and 40.8 km E of Nullagine, including 2 records in the survey area and 8 records in the contextual area.	**Recorded**: A total of 2,890 individuals were recorded from 911 additional locations in the survey area, between 8.7 km N and 10.5 S km S of Nullagine. A further 784 individuals were recorded from 40 locations in the contextual area. This species would be similarly abundant through adjoining habitats in the vicinity.
Acacia cyperophylla* var. *omearana	Tree to 10 m tall with 'minni-ritchi' bark.	Stony and gritty alluvium along major drainage lines.	✓	✓	✓			✓	**Recorded (apparently)**: a WA Herbarium voucher specimen to support a group of 6-20 plants was apparently collected within the survey area, however the location coordinates do not correspond to the description, which describes the collection location as being 2 km E of Nullagine.	**Recorded**: A single individual was found on the S bank of the Nullagine River, in the Nullagine Bypass section of the survey area.
Acacia fecunda	Erect obconic shrub to 3 m tall.	Along shallow creeks and drainage lines, hills, road verges.	✓	✓	✓				**May occur**: associated with the Mosquito land system, which is present in the survey area (NR 12 km E of Nullagine).	Unlikely to occur: not recorded during the field survey.
***Acacia* sp. Nullagine (B.R. Maslin 4955)**	Erect, spindly shrub to 3 m tall, with minni-ritchi bark.	Rocky clay in low-lying areas between rocky hills.	✓		✓				**May occur**: suitable habitat may be present (NR 9 km W of the northern extent).	Unlikely to occur; no particularly suitable habitat present and not recorded during the field survey,
Atriplex spinulosa	Rounded annual herb (saltbush) to 20 cm tall.	Stony plains and low hills	✓	✓	✓			✓	**Recorded**: has been recorded from 5 locations in the Mosquito land system within 1 km of the Nullagine townsite, including 2 locations within the survey area that are in the centre of town. Also recorded by WoodGIS (2019), however location coordinates and population details were not provided in a format suitable for interrogation.	**Recorded/Likely to occur**: not recorded during the field survey at the 2 historical locations, however this annual herb may not have been visible at the time of the survey, or may potentially have been cleared due to the location in an urban area. Suitable habitat is present in the vicinity and this species is considered as a minimum likely to occur.
Calotis squamigera	Procumbent annual daisy to 20 cm tall.	Pebbly loam.			✓				Unlikely to occur: one record in the locality associated with the Fortescue Marsh; suitable habitat unlikely to be present in the survey area (NR 40 km W of the southern extent).	Unlikely to occur.
Cochlospermum macnamarae	Spreading multi-stemmed shrub to 2 m tall and 3 m wide.	Rockpiles and ridges on basalt.	✓		✓				Unlikely to occur: suitable habitat unlikely to occur in the survey area (NR 15 km W of northern extent).	Unlikely to occur: no suitable habitat and not recorded during the field survey.
Eremophila pilosa	Shrub to 80 cm tall.	Red-brown clay loam on sandy plains.		✓	✓				Would not occur: no suitable habitat in survey area (NR 33 km S of southern extent).	Would not occur.
***Fimbristylis* sp. Shay Gap (K.R. Newbey 10293)**	Tufted annual, sedge to 15 cm tall.	Sandy soil on drainage lines.	✓	✓	✓				Unlikely to occur: suitable habitat may be present, however species is very infrequently recorded in the locality (NR 22 km E of northern extent)	Unlikely to occur: not recorded during the field survey.
Helichrysum oligochaetum	Erect annual daisy to 25 cm tall.	Red clay on alluvial plains.		✓	✓				Unlikely to occur: suitable habitat does not appear to extend into the survey area (NR 34 km S of southern extent)	Unlikely to occur.
Ptilotus wilsonii	Shrub to 50 cm tall.	Stony gravelly soils on rocky hills.	✓		✓			✓	**Likely to occur**: habitat appears to occur within survey area, and recorded in close proximity (NR 780 m NW of Nullagine town).	Unlikely to occur: minimal habitat within the survey area and not recorded during the field survey.
***Samolus* sp. Fortescue Marsh (A. Markey & R. Coppen FM 9702)**	Erect perennial herb.	Damp floodplains, marshes, saline flats.	✓		✓				Would not occur: this species grows in the Fortescue Marsh; there is no suitable habitat in the survey area (NR 18 km SW of southern extent).	Would not occur.
***Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)**	Shrub to 1 m tall.	Clay / saline flats in the Mosquito land system.	✓		✓			✓	**Recorded**: recorded from multiple locations in the locality extending over an area from Nullagine townsite to 13.5 km S and 26.1 km E, including 1 location within the survey area (where this species was described as being "infrequent"), and 2 locations in the contextual area. Additional records by WoodGIS (2019), however location coordinates and population details were not provided in a format suitable for interrogation.	**Recorded**: 44 individuals recorded from 15 locations distributed over an area from 2 km N to 61 S km south of Nullagine; majority of records around Nullagine.
***Stemodia* sp. Battle Hill (A.L. Payne 1006)**	Low shrub.	Cracking clay, floodplains.	✓		✓				**May occur**: may be suitable habitat within the survey area, however this species is recorded infrequently in the surrounding areas (NR 7.6 km W of the southern extent).	Unlikely to occur: no particularly suitable habitat, and not recorded during the field survey.

Taxon	Habit (WA Herbarium 2020)	Habitat (WA Herbarium 2020)	Databases			Previous Surveys			Likelihood of Occurrence in the Survey Area	
			Nature Map	DBCA TPFL	WA Herbarium	Astron 2014	GHD 2016	WoodGIS 2019	Initial Ranking Based on Desktop Review	Final Ranking Including Results of 2020 Field Survey
Tecticornia globulifera	Low shrub (samphire).	Saline flats, marshes.	✓		✓				Would not occur: this species grows in the Fortescue Marsh; there is no suitable habitat in the survey area (NR 37 km W of the southern extent).	Would not occur.
***Tecticornia* sp. Christmas Creek (K.A. Shepherd & T. Colmer et al. KS 1063)**	Low shrub (samphire).	Saline flats, marshes.	✓		✓				Would not occur: this species grows in the Fortescue Marsh; there is no suitable habitat in the survey area (NR 20 km W of the southern extent).	Would not occur.
Priority 2										
Euphorbia inappendiculata* var. *inappendiculata	Annual herb.	Cracking clay plains.							Unlikely to occur: infrequently recorded in the Pilbara, with one record from the adjacent Gascoyne bioregion; not recorded previously in the locality (NR 101 km S), and minimal suitable habitat likely to be present.	**Recorded**: scattered individuals present at 2 locations in the centre of the survey area, both on cracking clay substrates.
Indigofera ixocarpa	Shrub to 1 m tall.	Skeletal red soils over massive ironstone.	✓	✓	✓				**May occur**: suitable habitat may be present in the survey area, and there is a record in close proximity (NR 3.5 km W of Nullagine town).	Unlikely to occur: no suitable habitat in the survey area and not recorded during the field survey.
Ipomoea racemigera	Annual creeper with white flowers.	Creeklines and floodplains.							Unlikely to occur: infrequently recorded in the Pilbara, with an outlying record from north of Kununurra in the Kimberley; not recorded previously in the locality (NR 81 km S).	**Recorded**: scattered individuals present at 5 locations (2 in close proximity) in creeklines in the survey area, extending from 10 km N to 55 km S of Nullagine.
Paspalidium retiglume	Annual grass.	Cracking clay plains.							Unlikely to occur: infrequently recorded in the Pilbara, not recorded previously in the locality (NR 127 km W), and minimal suitable habitat likely to be present.	**Recorded**: scattered individuals present at 1 location on cracking clay substrate in the centre of the survey area.
Priority 3										
Acacia levata	Spreading, multi-stemmed shrub, to 3 m tall and 5 m wide.	Sand or sandy loam over granite on hillslopes.			✓				Unlikely to occur: some suitable habitat may be present, however this species is recorded infrequently and the nearest record is distant (NR 40 km W of Nullagine town).	Unlikely to occur.
Atriplex flabelliformis	Erect rounded perennial herb (saltbush), to 35 cm tall.	Clay loam or loam on saline flats and in marshes.	✓		✓				Would not occur: this species grows in the Fortescue Marsh; there is no suitable habitat in the survey area (NR 40 km W of the southern extent)	Would not occur.
Dysphania congestiflora	Annual herb	Clay plains, saline flats.	✓						Unlikely to occur: this species has been recorded infrequently and only in the Fortescue Marsh to date; unlikely to be suitable habitat in the survey area.	Unlikely to occur.
Eleocharis papillosa	Annual sedge.	Red clay over granite, on open clay flats and clay pans.	✓		✓				Unlikely to occur: this species is recorded infrequently in the region, and the only records from the locality are associated with the Fortescue Marsh (NR 26 km W of southern extent).	Unlikely to occur.
Eragrostis crateriformis	Annual grass to 40 cm tall.	Clayey loam or clay on creek banks, depressions.	✓		✓				**Recorded**: one historical record from a creekline at the N end of the survey area; several other records from the broader locality, extending from 1.8 km N of the northern extent of the survey area, to 37 km S of the southern extent.	**Recorded**: not recorded at the historical location during the field survey, but recorded from 6 other locations through the central section of the survey area.
***Eragrostis* sp. Erect spikelets (P.K. Latz 2122)**	Perennial grass to 30 cm tall.	Clay flats near Fortescue Marsh.	✓		✓				Unlikely to occur: one record associated with the Fortescue Marsh; there is no suitable habitat in the survey area (NR 14 km SW of southern extent).	Unlikely to occur.
Eremophila spongiocarpa	Compact, succulent-leaved shrub to 1 m tall.	Weakly saline alluvial plain on margins of marsh.	✓	✓	✓				Would not occur: this species grows in and surrounding the Fortescue Marsh; there is no suitable habitat in the survey area (NR 12 km SW of southern extent).	Would not occur.
Eucalyptus rowleyi	Mallee to 5 m tall.	Low plains and creeks.	✓		✓				**May occur**: records from south of the southern extent, and east of the northern extent of the survey area; suitable habitat likely to be present, however nearest record is 12 km from survey area.	Unlikely to occur: not recorded during the field survey.
Heliotropium murinum	Perennial herb to low shrub to 40 cm tall.	Sandy plains and floodplains.			✓				Unlikely to occur: some suitable habitat may be present however species is only recorded infrequently, and there are no records in close proximity (NR 32 km W of northern extent).	Unlikely to occur.

Taxon	Habit (WA Herbarium 2020)	Habitat (WA Herbarium 2020)	Databases			Previous Surveys			Likelihood of Occurrence in the Survey Area	
			Nature Map	DBCA TPFL	WA Herbarium	Astron 2014	GHD 2016	WoodGIS 2019	Initial Ranking Based on Desktop Review	Final Ranking Including Results of 2020 Field Survey
Iotasperma sessilifolium	Erect annual daisy.	Cracking clay plains, edges of waterholes.	✓		✓				**May occur**: some suitable habitat may be present; one record in close proximity (NR 4 km W of the southern extent).	**May occur**; some habitat in the survey area, and species is a winter-flowering daisy that would be unlikely to be recorded during the field survey.
Nicotiana umbratica	Erect annual herb to 70 cm tall.	Shallow soils on rocky outcrops.	✓		✓				**May occur**: habitat likely to be present but no records in close proximity (NR 20 km W of northern extent).	**Recorded**: a total of 7 individuals were recorded at 2 locations 11.7 km and 48 km S of Nullagine, both associated with sheltered microhabitats at the base of boulders.
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	Spreading annual herb to 10 cm tall.	Cracking clay plains.	✓		✓				**May occur**: some suitable habitat may be present and a record in close proximity (NR 4 km W).	**Recorded**: scattered individuals present at 3 locations, including areas of cracking clay plain between 19.9 km and 22.1 km S of Nullagine, and a plain with small patches of cracking clay located 53 km S of Nullagine.
***Rhagodia* sp. Hamersley (M. Trudgen 17794)**	Slender spindly chenopod shrub to 2 m tall.	Hardpan plains and stony plains, typically associated with Mulga.	✓		✓		✓		**Recorded**: two historical records within the survey area, 3 individuals at 58 km S and 2 individuals at 59 km S of Nullagine (GHD 2016); numerous other records in the locality.	**Recorded**: northern record of GHD (2016) was not relocated, however the area had been burnt; 4 individuals were recorded in the vicinity of the southern record of GHD (2016); another individual was recorded 3.4 km S (62 km S of Nullagine).
Rostellularia adscendens* var. *latifolia	Perennial herb or low shrub to 30 cm tall.	Various habitats, including Ironstone soils near creeks, rocky hills.	✓		✓				**Likely to occur**: infrequently recorded, however suitable habitat is diverse, so would likely be present; one record in close proximity (NR 7 km E of the northern extent).	**May occur**: not recorded during the field survey, however this inconspicuous species has broad habitat preferences and may be overlooked without intensive searches.
Swainsona thompsoniana	Small erect annual herb.	Cracking clay plains.	✓		✓				**May occur**: some suitable habitat may be present, record in vicinity (NR 8 km W of southern extent).	**Recorded**: scattered individuals present at a single location on cracking clay in the centre of the survey area, 20 km S of Nullagine.
Tecticornia medusa	Low shrub (samphire).	Saline flats, marshes.	✓		✓				Would not occur: this species grows in the Fortescue Marsh; there is no suitable habitat in the survey area (NR 15 km S of southern extent).	Would not occur.
***Themeda* sp. Hamersley Station (M.E. Trudgen 11431)**	Perennial tussock grass to 1.8 m tall.	Red clay (often cracking) in clay pans and on plains, sometimes along creeklines.	✓		✓				**May occur**: some suitable habitat may be present, and records on either side of the survey area (13 km E of northern extent, 26 km W of southern extent).	**Recorded**: present at 3 locations in creeklines or areas of clay between 50.3-59.1 km S of Nullagine, providing 0.1% cover at 1 location, and 25 and 5 individuals at the other 2 locations. An unconfirmed specimen of *Themeda* ? sp. Hamersley Station (M.E. Trudgen 11431) was also collected near a creekline on a plain 44.1 km S of Nullagine.
Triodia basitricha	Hummock grass.	Rocky hillslopes.			✓				Unlikely to occur: suitable habitat may be present, however not recorded nearby (NR 38 km NE of the northern extent).	Unlikely to occur: no particularly suitable habitat and not recorded during the field survey.
Priority 4										
Bulbostylis burbidgeae	Tufted, erect to spreading annual sedge to 10 cm tall.	Granitic soils around granite outcrops, cliff bases.	✓		✓				Unlikely to occur: some suitable habitat may be present, but not recorded nearby (NR 34 km N of northern extent).	Unlikely to occur: some suitable habitat, but not recorded during the survey despite specific targeted searches in seepages around boulders.
Eremophila youngii* subsp. *lepidota	Dense, spreading shrub to 3 m tall.	Stony red sandy loam on clay flats and floodplains, sometimes semi-saline.	✓		✓	✓			Unlikely to occur: in the Pilbara, there are no records of this species north of fringing habitats associated with the Fortescue Marsh; unlikely to be any suitable habitat in the survey area (NR 13 km S of southern extent).	Unlikely to occur: not recorded during the field survey.
Goodenia nuda	Slender erect herb to 50 cm tall.	Creeks, floodplains, low-lying areas.	✓	✓	✓				**Likely to occur**: 1 record from a creekline in the northern end of the contextual area; several other records from plains fringing the Fortescue Marsh, south of the southern extent of the survey area.	**Recorded**: scattered individuals recorded at 3 locations in creeklines or floodplains, spread from 3.2 km N to 35.9 km S of Nullagine.
Lepidium catapycnon	Open, woody low shrub to 40 cm tall.	Skeletal soils on hillsides and tall ridge slopes.	✓	✓	✓				**May occur**: recorded within the Mosquito land system (NR 16.9 km E of Nullagine townsite).	Unlikely to occur: no particularly suitable habitat and not recorded during the field survey.
Ptilotus mollis	Compact perennial shrub to 50 cm tall.	Stony hills and screes.	✓		✓				**May occur**: several records on either side of the northern half of the survey area, including a record in close proximity, but habitat does not appear to extend into the survey area (NR 2.8 km E of the northern end).	Unlikely to occur: no particularly suitable habitat and not recorded during the field survey.

Appendix 4

Potential Fauna Species List

Mammals

Family/*Species*	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Tachyglossidae												
Tachyglossus aculeatus	Short-beaked Echidna			•	•			•	•		•	
Dasyuridae												
Dasycercus blythi	Brush-tailed Mulgara, Ampurta	P4		•	•			•[4]				•
Dasykaluta rosamondae	Little Red Kaluta			•	•			•	•			
Dasyurus hallucatus	Northern Quoll	EN	EN	•	•	•		•	•			•
Ningaui timealeyi	Pilbara Ningaui			•	•			•				
Planigale ingrami[1]	Long-tailed Planigale			•	•							
Planigale maculata[1]	Common Planigale			•	•							
Planigale sp. (aff. *maculata)*[1]								•	•			
Pseudantechinus roryi	Rory's Pseudantechinus				•				•			
Pseudantechinus woolleyae	Woolley's Pseudantechinus			•	•							
Sminthopsis longicaudata	Long-tailed Dunnart	P4					•	•				
Sminthopsis macroura	Stripe-faced Dunnart			•	•			•	•			
Sminthopsis youngsoni	Lesser Hairy-footed Dunnart				•			•				
Thylacomyidae												
Macrotis lagotis	Greater Bilby, Dalgyte, Ninu	VU	VU	•	•	•						•
Phalangeridae												
Trichosurus vulpecula[2]	Common Brushtail Possum			•	•							•
Macropodidae												
Lagorchestes conspicillatus leichardti	Spectacled Hare-wallaby	P4										•
Osphranter robustus[3]	Euro, Biggada			•	•			•	•	•	•	
Osphranter rufus[3]	Red Kangaroo, Marlu			•	•			•	•		•	
Petrogale rothschildi	Rothschild's Rock-wallaby			•	•			•	•			
Muridae												
Leggadina lakedownensis	Short-tailed Mouse	P4						•				•
Mus musculus	House Mouse			•	•	•		•	•			
Pseudomys chapmani	Western Pebble-mound Mouse, Ngadji	P4		•	•		•	•	•		•	•
Pseudomys delicatulus	Delicate Mouse			•	•							
Pseudomys desertor	Desert Mouse			•	•			•	•			
Pseudomys hermannsburgensis	Sandy Inland Mouse			•	•			•				
Zyzomys argurus	Common Rock-rat			•	•				•			
Pteropodidae												
Pteropus alecto	Black Flying-fox											
Megadermatidae												
Macroderma gigas	Ghost Bat	VU	VU	•	•	•	•					•
Hipposideridae												
Rhinonicteris aurantia (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU	•	•	•	•		•		•	
Emballonuridae												
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat			•	•			?	•		•	
Taphozous georgianus	Common Sheath-tailed Bat			•	•				•			
Taphozous hilli	Hill's Sheath-tailed Bat			•	•							
Molossidae												

Family/*Species*	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Austronomus australis	White-striped Free-tailed Bat							•				
Chaerephon jobensis	Greater Northern Free-tailed Bat			•	•			?				
Ozimops lumsdenae	Northern Free-tailed Bat											
Vespertilionidae												
Chalinolobus gouldii	Gould's Wattled Bat			•	•			•	•			
Chalinolobus morio	Chocolate Wattled Bat											
Nyctophilus daedalus	Pallid Long-eared Bat							?				
Nyctophilus geoffroyi	Lesser Long-eared Bat			•	•			?				
Scotorepens balstoni	Inland Broad-nosed Bat							?				
Scotorepens greyii	Little Broad-nosed Bat			•	•			•	•			
Vespadelus finlaysoni	Finlayson's Cave Bat			•	•				•		•	
Canidae												
Canis lupus	Dog/Dingo					•		•	•		•	
Vulpes vulpes	Red Fox				•	•						
Felidae												
Felis catus	Cat			•	•	•		•	•		•	
Leporidae												
Oryctolagus cuniculus	European Rabbit					•						
Equidae												
Equus asinus	Donkey			•	•	•		•				
Equus caballus	Horse				•	•		•				
Suidae												
Sus scrofa	Pig					•						
Camelidae												
Camelus dromedarius	Dromedary Camel				•	•		•				
Bovidae												
Bos taurus	European Cattle			•	•			•	•	•	•	

[1] Planigales in the Pilbara now considered to belong to two species, both yet to formally be described
[2] Previous records from Pilbara often attributed to *T. v. arnhemensis* (VU), but more recent taxonomic work suggests Pilbara animals belong to southern *T. v. vulpecula* [*T. v. hypoleucos*]
[3] Previously included within genus *Macropus*, some previous records listed as such
[4] Listed as *D. cristicauda* prior to taxonomic revision

Birds

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Casuariidae												
Dromaius novaehollandiae	Emu			•	•			•	•	•	•	
Phasianidae												
Coturnix pectoralis	Stubble Quail			•	•			•				
Coturnix ypsilophora	Brown Quail			•	•			•	•			
Anatidae												
Dendrocygna eytoni	Plumed Whistling-Duck			•	•				•			
Cygnus atratus	Black Swan			•	•				•			
Tadorna tadornoides	Australian Shelduck							•				
Chenonetta jubata	Australian Wood Duck			•	•					•		
Anas rhynchotis	Australasian Shoveler				•							
Anas gracilis	Grey Teal			•	•							
Anas superciliosa	Pacific Black Duck			•	•				•			
Aythya australis	Hardhead			•	•							
Podicipedidae												
Tachybaptus novaehollandiae	Australasian Grebe			•	•				•			
Poliocephalus poliocephalus	Hoary-headed Grebe			•	•							
Columbidae												
Columba livia	Rock Dove					•						
Phaps chalcoptera	Common Bronzewing			•	•			•	•			
Ocyphaps lophotes	Crested Pigeon			•	•			•	•		•	
Geophaps plumifera	Spinifex Pigeon			•	•			•	•	•	•	
Geopelia cuneata	Diamond Dove			•	•			•	•	•	•	
Geopelia striata	Peaceful Dove			•	•			•	•		•	
Geopelia humeralis	Bar-shouldered Dove			•	•							
Podargidae												
Podargus strigoides	Tawny Frogmouth			•	•			•	•			
Caprimulgidae												
Eurostopodus argus	Spotted Nightjar		MA	•	•				•			
Aegothelidae												
Aegotheles cristatus	Australian Owlet-nightjar			•	•			•	•			
Apodidae												
Apus pacificus	Fork-tailed Swift	MI	MI / MA	•	•	•	•	•				
Anhingidae												
Anhinga novaehollandiae	Australasian Darter			•	•				•			
Phalacrocoracidae												
Microcarbo melanoleucos	Little Pied Cormorant			•	•				•			
Phalacrocorax sulcirostris	Little Black Cormorant			•	•				•			
Pelecanidae												
Pelecanus conspicillatus	Australian Pelican		MA	•	•				•			
Ciconiidae												
Ephippiorhynchus asiaticus	Black-necked Stork			•	•							
Ardeidae												
Ardea pacifica	White-necked Heron			•	•			•	•	•		
Ardea modesta	Eastern Great Egret		MA	•	•	•		•	•			
Ardea ibis	Cattle Egret		MA			•						
Egretta novaehollandiae	White-faced Heron			•	•			•	•			
Egretta garzetta	Little Egret			•	•							

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Nycticorax caledonicus	Nankeen Night-Heron		MA	•	•				•			
Threskiornithidae												
Plegadis falcinellus	Glossy Ibis	MI	MI / MA				•					
Threskiornis spinicollis	Straw-necked Ibis		MA	•	•			•				
Platalea regia	Royal Spoonbill			•	•							
Platalea flavipes	Yellow-billed Spoonbill				•							
Accipitridae												
Elanus axillaris	Black-shouldered Kite			•	•			•	•			
Hamirostra melanosternon	Black-breasted Buzzard			•	•			•				
Haliaeetus leucogaster	White-bellied Sea-Eagle		MA			•						
Haliastur sphenurus	Whistling Kite		MA	•	•			•	•		•	
Milvus migrans	Black Kite			•	•			•	•			
Accipiter fasciatus	Brown Goshawk		MA	•	•			•	•			
Accipiter cirrocephalus	Collared Sparrowhawk			•	•			•				
Circus assimilis	Spotted Harrier			•	•			•	•			
Circus approximans	Swamp Harrier		MA		•							
Aquila audax	Wedge-tailed Eagle			•	•			•	•	•	•	
Hieraaetus morphnoides	Little Eagle			•	•			•	•		•	
Falconidae												
Falco cenchroides	Nankeen Kestrel		MA	•	•			•	•		•	
Falco berigora	Brown Falcon			•	•			•	•	•	•	
Falco longipennis	Australian Hobby			•	•			•	•			
Falco hypoleucos	Grey Falcon	VU	VU	•	•		•		•			•
Falco subniger	Black Falcon							•				
Falco peregrinus	Peregrine Falcon	OS		•	•		•	•				•
Rallidae												
Gallirallus philippensis	Buff-Banded Rail		MA	•	•							
Fulica atra	Eurasian Coot			•	•							
Otididae												
Ardeotis australis	Australian Bustard			•	•			•	•		•	
Burhinidae												
Burhinus grallarius	Bush Stone-curlew			•	•				•		•	
Recurvirostridae												
Himantopus [himantopus] leucocephalus	Black-winged [Pied] Stilt		MA	•	•							
Charadriidae												
Charadrius veredus	Oriental Plover	MI	MI / MA			•	•					
Charadrius australis	Inland Dotterel							•				
Elseyornis melanops	Black-fronted Dotterel			•	•				•			
Erythrogonys cinctus	Red-kneed Dotterel				•							
Rostratulidae												
Rostratula australis	Australian Painted Snipe	EN	EN / MA			•			•			
Scolopacidae												
Actitis hypoleucos	Common Sandpiper	MI	MI / MA			•						
Tringa nebularia	Common Greenshank	MI	MI / MA				•					
Tringa stagnatilis	Marsh Sandpiper	MI	MI / MA				•					
Tringa glareola	Wood Sandpiper	MI	MI / MA	•	•		•					
Calidris ruficollis	Red-necked Stint		MA		•							
Calidris melanotos	Pectoral Sandpiper	MI	MI / MA			•						
Calidris acuminata	Sharp-tailed Sandpiper	MI	MI / MA	•	•	•	•					
Calidris ferruginea	Curlew Sandpiper	CR / MI	CR / MI / MA			•						

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Turnicidae												
Turnix velox	Little Button-quail			•	•			•	•		•	
Glareolidae												
Stiltia isabella	Australian Pratincole											
Laridae												
Gelochelidon nilotica	Gull-billed Tern	MI	MI / MA		•		•					
Hydroprogne caspia	Caspian Tern	MI	MI / MA				•					
Chlidonias leucopterus	White-winged Black-Tern	MI	MI / MA						•			
Cacatuidae												
Eolophus roseicapillus	Galah			•	•			•	•	•	•	
Cacatua sanguinea	Little Corella			•	•			•	•	•	•	
Nymphicus hollandicus	Cockatiel			•	•			•	•		•	
Psittacidae												
Polytelis alexandrae	Princess Parrot	P4	VU			•						
Barnardius zonarius	Australian Ringneck			•	•			•	•		•	
Psephotus varius	Mulga Parrot									•	•	
Melopsittacus undulatus	Budgerigar			•	•			•	•		•	
Neopsephotus bourkii	Bourke's Parrot			•	•			•				
Neophema elegans	Elegant Parrot							•				
Pezoporus occidentalis	Night Parrot	CR	EN			•						
Centropodidae												
Centropus phasianinus	Pheasant Coucal			•	•			•				
Cuculidae												
Chalcites basalis	Horsfield's Bronze-Cuckoo		MA	•	•			•	•			
Chalcites osculans	Black-eared Cuckoo		MA			•		•	•			
Cacomantis pallidus	Pallid Cuckoo		MA	•	•			•	•			
Strigidae												
Ninox connivens	Barking Owl											
Ninox novaeseelandiae	Southern Boobook		MA					•	•		•	
Tytonidae												
Tyto javanica	Eastern Barn Owl			•	•							
Halcyonidae												
Dacelo leachii	Blue-winged Kookaburra			•	•			•	•		•	
Todiramphus pyrrhopygius	Red-backed Kingfisher			•	•			•	•	•		
Todiramphus sanctus	Sacred Kingfisher		MA	•	•			•	•			
Meropidae												
Merops ornatus	Rainbow Bee-eater		MA	•	•			•	•		•	
Ptilonorhynchidae												
Ptilonorhynchus guttatus	Western Bowerbird			•	•				•			
Maluridae												
Malurus leucopterus	White-winged Fairy-wren			•	•			•	•		•	
Malurus [lamberti] assimilis	Variegated [Purple-backed] Fairy-wren			•	•			•	•		•	
Stipiturus ruficeps	Rufous-crowned Emu-wren			•	•			•				
Amytornis striatus whitei	Striated [Pilbara] Grasswren			•	•			•	•			
Acanthizidae												
Pyrrholaemus brunneus	Redthroat			•	•			•				
Smicrornis brevirostris	Weebill			•	•			•	•			
Gerygone fusca	Western Gerygone			•	•			•				
Acanthiza robustirostris	Slaty-backed Thornbill				•			•				
Acanthiza chrysorrhoa	Yellow-rumped Thornbill			•	•				•			

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Acanthiza uropygialis	Chestnut-rumped Thornbill			•	•			•				
Acanthiza apicalis	Inland Thornbill			•	•			•				
Aphelocephala leucopsis	Southern Whiteface							•				
Pardalotidae												
Pardalotus rubricatus	Red-browed Pardalote			•	•			•	•		•	
Pardalotus striatus	Striated Pardalote			•	•			•				
Meliphagidae												
Certhionyx variegatus	Pied Honeyeater			•	•			•				
Lichenostomus virescens	Singing Honeyeater			•	•			•	•	•	•	
Lichenostomus keartlandi	Grey-headed Honeyeater			•	•			•	•	•	•	
Lichenostomus penicillatus	White-plumed Honeyeater				•			•	•	•	•	
Purnella albifrons	White-fronted Honeyeater				•							
Manorina flavigula	Yellow-throated Miner			•	•			•	•	•	•	
Acanthagenys rufogularis	Spiny-cheeked Honeyeater			•	•			•	•			
Epthianura tricolor	Crimson Chat			•	•			•			•	
Epthianura aurifrons	Orange Chat				•							
Sugomel niger	Black Honeyeater							•				
Lichmera indistincta	Brown Honeyeater			•	•			•			•	
Melithreptus gularis	Black-chinned Honeyeater			•	•			•				
Pomatostomidae												
Pomatostomus temporalis	Grey-crowned Babbler			•	•			•		•	•	
Pomatostomus superciliosus	White-browed Babbler			•	•			•				
Cinclosomatidae												
Cinclosoma [castaneothorax] marginatum	Chestnut-breasted [Western] Quail-thrush			•	•			•				
Neosittidae												
Daphoenositta chrysoptera	Varied Sittella			•	•			•				
Campephagidae												
Coracina maxima	Ground Cuckoo-shrike				•			•				
Coracina novaehollandiae	Black-faced Cuckoo-shrike		MA	•	•			•	•	•	•	
Lalage sueurii	White-winged Triller			•	•			•	•			
Pachycephalidae												
Pachycephala rufiventris	Rufous Whistler			•	•			•	•		•	
Colluricincla harmonica	Grey Shrike-thrush			•	•			•	•		•	
Oreoica gutturalis	Crested Bellbird			•	•			•	•		•	
Artamidae												
Artamus personatus	Masked Woodswallow			•	•			•	•			
Artamus cinereus	Black-faced Woodswallow			•	•			•	•	•	•	
Artamus minor	Little Woodswallow			•	•				•			
Cracticus torquatus	Grey Butcherbird			•	•			•				
Cracticus nigrogularis	Pied Butcherbird			•	•			•	•		•	
Cracticus tibicen	Australian Magpie			•	•			•	•			
Rhipiduridae												
Rhipidura albiscapa	Grey Fantail							•				
Rhipidura leucophrys	Willie Wagtail			•	•			•	•	•	•	
Corvidae												
Corvus coronoides	Australian Raven			•	•							
Corvus bennetti	Little Crow			•	•			•				
Corvus orru	Torresian Crow			•	•			•	•	•	•	
Monarchidae												
Grallina cyanoleuca	Magpie-lark		MA	•	•			•	•	•	•	

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Petroicidae												
Petroica goodenovii	Red-capped Robin			•	•			•				
Melanodryas cucullata	Hooded Robin			•	•			•				
Alaudidae												
Mirafra javanica	Horsfield's Bushlark			•	•			•	•		•	
Acrocephalidae												
Acrocephalus australis	Australian Reed-Warbler			•	•				•			
Megaluridae												
Cincloramphus mathewsi	Rufous Songlark				•			•	•			
Cincloramphus cruralis	Brown Songlark							•	•			
Eremiornis carteri	Spinifexbird			•	•			•	•		•	
Hirundinidae												
Hirundo rustica	Barn Swallow	MI	MI / MA			•						
Hirundo neoxena	Welcome Swallow		MA	•	•							
Petrochelidon ariel	Fairy Martin			•	•			•	•			
Petrochelidon nigricans	Tree Martin		MA	•	•			•	•			
Nectariniidae												
Dicaeum hirundinaceum	Mistletoebird			•	•			•	•		•	
Estrildidae												
Taeniopygia guttata	Zebra Finch			•	•			•	•	•	•	
Neochmia ruficauda	Star Finch			•	•				•			
Emblema pictum	Painted Finch			•	•			•	•		•	
Motacillidae												
Anthus novaeseelandiae	Australasian Pipit		MA	•	•			•	•		•	
Motacilla tschutschensis	Eastern Yellow Wagtail	MI	MI / MA			•						
Motacilla cinerea	Grey Wagtail	MI	MI / MA			•						

Reptiles

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Chelidae												
Chelodina steindachneri	Flat-shelled Turtle			•	•			•	•		•	
Carphodactylidae												
Nephrurus wheeleri				•	•							
Diplodactylidae												
Crenadactylus pilbarensis[1]	Clawless Gecko			•	•							
Diplodactylus conspicillatus	Fat-tailed Gecko			•	•			•				
Diplodactylus pulcher				•	•							
Diplodactylus savagei	Southern Pilbara Beak-faced Gecko			•	•				•			
Lucasium stenodactylum				•	•			•	•		•	
Lucasium wombeyi				•	•			•	•			
Oedura fimbria[2]	Western Marbled Velvet Gecko			•	•							
Rhynchoedura ornata	Western Beaked Gecko			•	•							
Strophurus elderi				•	•			•	•			
Strophurus wellingtonae				•	•			•	•			
Gekkonidae												
Gehyra media[3]												
Gehyra micra[3]												
Gehyra montium[4]												
Gehyra pilbara				•	•				•		•	
Gehyra punctata[5]				•	•			•			•	
Gehyra purpurascens				•	•							
Gehyra variegata[6]				•	•			•	•		•	
Heteronotia binoei	Bynoe's Gecko			•	•			•	•		•	
Heteronotia spelea	Desert Cave Gecko, Pilbara Cave Gecko			•	•							
Pygopodidae												
Delma butleri				•	•			•	•			
Delma elegans				•	•							
Delma nasuta				•	•			•	•			
Delma pax				•	•			•	•			
Delma tincta				•	•			•				
Lialis burtonis	Burton's Legless Lizard			•	•			•	•			
Pygopus nigriceps					•			•				
Agamidae												
Ctenophorus caudicinctus	Ring-tailed Dragon			•	•			•	•	•	•	
Ctenophorus isolepis	Crested Dragon, Military Dragon			•	•			•			•	
Ctenophorus nuchalis	Central Netted Dragon			•	•						•	
Ctenophorus reticulatus	Western Netted Dragon			•	•			•	•			
Diporiphora valens	Southern Pilbara Tree Dragon			•	•							
Gowidon longirostris[7]	Long-nosed Dragon			•	•			•	•		•	
Lophognathus horneri[8]	Northern Tree Dragon				•							
Pogona minor	Dwarf Bearded Dragon			•	•			•	•			
Tympanocryptis fortescuensis[9]	Pebble Dragon				•							
Scincidae												
Carlia munda	Shaded-litter Rainbow Skink			•	•			•	•		•	
Carlia triacantha	Desert Rainbow Skink			•	•							
Cryptoblepharus ustulatus				•	•							
Ctenotus ariadnae								•				

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Ctenotus duricola				•	•			•				
Ctenotus grandis				•	•							
Ctenotus hanloni				•	•			•				
Ctenotus helenae				•	•			•				
Ctenotus leonhardii				•	•							
Ctenotus nigrilineatus		P1		•	•		•					•
Ctenotus pantherinus	Leopard Ctenotus			•	•			•	•		•	
Ctenotus piankai					•			•	•			
Ctenotus rubicundus				•	•							
Ctenotus rutilans				•	•							
Ctenotus saxatilis	Rock Ctenotus			•	•			•	•		•	
Ctenotus schomburgkii				•	•							
Ctenotus serventyi								•				
Ctenotus uber	Spotted Ctenotus			•	•							
Cyclodomorphus melanops	Slender Blue-tongue			•	•			•	•		•	
Egernia cygnitos	Western Pilbara Spiny-tailed Skink			•	•							
Egernia epsisolus	Eastern Pilbara Spiny-tailed Skink										•	
Egernia Formosa				•	•							
Eremiascincus richardsonii	Broad-banded Sand Swimmer			•	•				•			
Lerista amicorum				•	•							
Lerista bipes					•							
Lerista flammicauda				•	•							
Lerista jacksoni				•	•							
Lerista labialis				•	•							
Lerista muelleri				•	•			•	•			
Lerista timida				•	•							
Lerista verhmens				•	•							
Menetia greyii	Common Dwarf Skink			•	•			•			•	
Menetia surda				•	•							
Morethia ruficauda				•	•			•	•		•	
Notoscincus ornatus				•	•							
Proablepharus reginae				•	•						•	
Tiliqua multifasciata	Central Blue-tongue			•	•				•		•	
Tiliqua occipitalis	Western Blue-tongue			•	•							
Varanidae												
Varanus acanthurus	Spiny-tailed Monitor			•	•			•	•		•	
Varanus brevicauda	Short-tailed Pygmy Monitor				•							
Varanus caudolineatus				•	•			•				
Varanus eremius	Pygmy Desert Monitor			•	•							
Varanus giganteus	Perentie			•	•			•	•			
Varanus gouldii	Sand Goanna, Bungarra			•	•							
Varanus panoptes	Yellow-spotted Monitor			•	•				•		•	
Varanus pilbarensis	Pilbara Rock Monitor			•	•				•			
Varanus tristis	Black-headed Monitor			•	•				•		•	
Typhlopidae												
Anilios ammodytes								•				
Anilios ganei	Gane's Blind Snake	P1										•
Anilios grypus									•			
Pythonidae												
Antaresia perthensis	Pygmy Python			•	•							

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Antaresia stimsoni	Stimson's Python			•	•						•	
Aspidites melanocephalus	Black-headed Python			•	•				•			
Liasis olivaceus barroni	Pilbara Olive Python	VU	VU	•	•	•	•		•			•
Elapidae												
Acanthophis wellsi	Pilbara Death Adder			•	•				•			
Brachyurophis approximans	North-western Shovel-nosed Snake			•	•							
Demansia psammophis	Yellow-faced Whipsnake			•	•			•	•			
Demansia rufescens	Rufous Whipsnake			•	•							
Furina ornata	Moon Snake			•	•				•		•	
Pseudechis australis	Mulga Snake			•	•			•				
Pseudonaja mengdeni[10]	Western Brown Snake			•	•				•			
Pseudonaja modesta	Ringed Brown Snake			•	•			•				
Suta fasciata	Rosen's Snake			•	•				•			
Suta punctata	Spotted Snake			•	•			•				

[1] Previously included within *C. ocellatus*, and listed as such in previous records.

[2] Previously included within *O. marmorata*, and listed as such in previous records.

[3] Previously included within *G. punctata;* some previous records of that species may be referable to either/both of these species.

[4] Distribution recently revised; some previous records of *G. punctata* and *G. variegata* may be attributable to this species.

[5] Previous records of *G. punctata* may also involve several other newly-described taxa.

[6] Previous records of *G. variegata* may also involve several other newly-described taxa.

[7] Previously included variously within genera *Amphibolurus* and *Lophognathus*; some previous records listed as such.

[8] Previously included within *L. gilberti*, and listed as such in previous records.

[9] Previously included within *T. cephalus*, and listed as such in previous records.

[10] Previously included within *P. nuchalis*, and listed as such in some previous records.

Amphibians

Family/Species	Common Name	Conservation Status		NatureMap		EPBC ACT PMS	DBCA Threatened Fauna	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)
		State	C'wealth	10 km buffer	20 km buffer							
Pelodryadidae												
Cyclorana maini	Sheep Frog			•	•			•	•			
Cyclorana occidentalis[1]	Western Water-holding Frog				•							
Litoria rubella	Little Red Tree Frog			•	•				•		•	
Limnodynastidae												
Neobatrachus aquilonius	Northern Burrowing Frog								•			
Neobatrachus sutor	Shoemaker Frog				•							
Notaden nichollsi	Desert Spadefoot							•				
Platyplectrum spenceri	Centralian Burrowing Frog			•	•							
Myobatrachidae												
Pseudophryne douglasi	Gorge Toadlet			•	•							
Uperoleia glandulosa	Glandular Toadlet			•	•				•			
Uperoleia saxatilis[2]	Pilbara Toadlet			•	•							

[1] previously included within *C. platycephala*, previous records listed as such.

[2] previously included within *U. russelli*, some previous records listed as such.

Appendix 5

Fauna Species Recorded by the Current Survey

Mammals

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Tachyglossidae			
Tachyglossus aculeatus	Short-beaked Echidna		
Dasyuridae			
*Dasyurus hallucatus**	Northern Quoll*	(EN)	(EN)
Macropodidae			
Osphranter robustus	Euro, Biggada		
Osphranter rufus	Red Kangaroo, Marlu		
Petrogale rothschildi	Rothschild's Rock-wallaby		
Muridae			
Pseudomys chapmani	Western Pebble-mound Mouse, Ngadji	P4	
Pteropodidae			
Pteropus alecto	Black Flying-fox		
Megadermatidae			
Macroderma gigas^	Ghost Bat^	(VU)	(VU)
Hipposideridae			
Rhinonicteris aurantia (Pilbara form)	Pilbara Leaf-nosed Bat	VU	VU
Emballonuridae			
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat		
Taphozous georgianus	Common Sheath-tailed Bat		
Molossidae			
Austronomus australis	White-striped Free-tailed Bat		
Chaerephon jobensis	Greater Northern Free-tailed Bat		
Ozimops lumsdenae	Northern Free-tailed Bat		
Vespertilionidae			
Chalinolobus gouldii	Gould's Wattled Bat		
Chalinolobus morio	Chocolate Wattled Bat		
Nyctophilus daedalus	Pallid Long-eared Bat		
Nyctophilus geoffroyi	Lesser Long-eared Bat		
Scotorepens greyii	Little Broad-nosed Bat		
Vespadelus finlaysoni	Finlayson's Cave Bat		
Canidae			
Canis lupus	Dog/Dingo		
Felidae			
Felis catus	Cat		
Bovidae			
Bos taurus	European Cattle		

* Probable track found in contextual area

^ Individual seen in close proximity to contextual area

Birds

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Anatidae			
Chenonetta jubata	Australian Wood Duck		
Anas superciliosa	Pacific Black Duck		
Columbidae			
Phaps chalcoptera	Common Bronzewing		
Ocyphaps lophotes	Crested Pigeon		
Geophaps plumifera	Spinifex Pigeon		
Geopelia cuneata	Diamond Dove		
Geopelia striata	Peaceful Dove		
Podargidae			
Podargus strigoides	Tawny Frogmouth		
Caprimulgidae			
Eurostopodus argus	Spotted Nightjar		
Aegothelidae			
Aegotheles cristatus	Australian Owlet-nightjar		
Ardeidae			
Ardea pacifica	White-necked Heron		
Egretta novaehollandiae	White-faced Heron		
Nycticorax caledonicus	Nankeen Night-Heron		
Accipitridae			
Haliastur sphenurus	Whistling Kite		
Milvus migrans	Black Kite		
Accipiter fasciatus	Brown Goshawk		
Circus assimilis	Spotted Harrier		
Circus approximans	Swamp Harrier		
Aquila audax	Wedge-tailed Eagle		
Hieraaetus morphnoides	Little Eagle		
Falconidae			
Falco cenchroides	Nankeen Kestrel		
Falco berigora	Brown Falcon		
Falco longipennis	Australian Hobby		
Burhinidae			
Burhinus grallarius	Bush Stone-curlew		
Charadriidae			
Elseyornis melanops	Black-fronted Dotterel		
Turnicidae			
Turnix velox	Little Button-quail		
Glareolidae			
Stiltia isabella	Australian Pratincole		
Cacatuidae			
Eolophus roseicapillus	Galah		
Cacatua sanguinea	Little Corella		
Nymphicus hollandicus	Cockatiel		
Psittacidae			
Barnardius zonarius	Australian Ringneck		
Melopsittacus undulatus	Budgerigar		
Cuculidae			
Chalcites basalis	Horsfield's Bronze-Cuckoo		
Strigidae			
Ninox connivens	Barking Owl		

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Ninox novaeseelandiae	Southern Boobook		
Halcyonidae			
Dacelo leachii	Blue-winged Kookaburra		
Todiramphus pyrrhopygius	Red-backed Kingfisher		
Todiramphus sanctus	Sacred Kingfisher		
Meropidae			
Merops ornatus	Rainbow Bee-eater		
Ptilonorhynchidae			
Ptilonorhynchus guttatus	Western Bowerbird		
Maluridae			
Malurus leucopterus	White-winged Fairy-wren		
Malurus [lamberti] assimilis	Variegated [Purple-backed] Fairy-wren		
Amytornis striatus whitei	Striated [Pilbara] Grasswren		
Acanthizidae			
Smicrornis brevirostris	Weebill		
Pardalotidae			
Pardalotus rubricatus	Red-browed Pardalote		
Pardalotus striatus	Striated Pardalote		
Meliphagidae			
Lichenostomus virescens	Singing Honeyeater		
Lichenostomus keartlandi	Grey-headed Honeyeater		
Lichenostomus penicillatus	White-plumed Honeyeater		
Purnella albifrons	White-fronted Honeyeater		
Manorina flavigula	Yellow-throated Miner		
Epthianura tricolor	Crimson Chat		
Lichmera indistincta	Brown Honeyeater		
Melithreptus gularis	Black-chinned Honeyeater		
Pomatostomidae			
Pomatostomus temporalis	Grey-crowned Babbler		
Campephagidae			
Coracina novaehollandiae	Black-faced Cuckoo-shrike		
Lalage sueurii	White-winged Triller		
Pachycephalidae			
Pachycephala rufiventris	Rufous Whistler		
Colluricincla harmonica	Grey Shrike-thrush		
Oreoica gutturalis	Crested Bellbird		
Artamidae			
Artamus cinereus	Black-faced Woodswallow		
Artamus minor	Little Woodswallow		
Cracticus nigrogularis	Pied Butcherbird		
Cracticus tibicen	Australian Magpie		
Rhipiduridae			
Rhipidura leucophrys	Willie Wagtail		
Corvidae			
Corvus orru	Torresian Crow		
Monarchidae			
Grallina cyanoleuca	Magpie-lark		
Alaudidae			
Mirafra javanica	Horsfield's Bushlark		
Acrocephalidae			
Acrocephalus australis	Australian Reed-Warbler		

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Megaluridae			
Cincloramphus mathewsi	Rufous Songlark		
Cincloramphus cruralis	Brown Songlark		
Eremiornis carteri	Spinifexbird		
Hirundinidae			
Petrochelidon ariel	Fairy Martin		
Petrochelidon nigricans	Tree Martin		
Nectariniidae			
Dicaeum hirundinaceum	Mistletoebird		
Estrildidae			
Taeniopygia guttata	Zebra Finch		
Emblema pictum	Painted Finch		
Motacillidae			
Anthus novaeseelandiae	Australasian Pipit		

Reptiles

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Chelidae			
Chelodina steindachneri	Flat-shelled Turtle		
Diplodactylidae			
Oedura fimbria	Western Marbled Velvet Gecko		
Gekkonidae			
Gehyra media			
Gehyra montium			
Gehyra pilbara			
Gehyra punctata			
Heteronotia binoei	Bynoe's Gecko		
Heteronotia spelea	Desert Cave Gecko		
Pygopodidae			
Lialis burtonis	Burton's Legless Lizard		
Agamidae			
Ctenophorus caudicinctus	Ring-tailed Dragon		
Gowidon longirostris	Long-nosed Dragon		
Scincidae			
Ctenotus duricola			
Ctenotus pantherinus	Leopard Ctenotus		
Ctenotus saxatilis	Rock Ctenotus		
Cyclodomorphus melanops	Slender Blue-tongue		
Morethia ruficauda			
Tiliqua multifasciata	Central Blue-tongue		
Varanidae			
Varanus acanthurus	Spiny-tailed Monitor		
Varanus giganteus	Perentie		
Varanus panoptes	Yellow-spotted Monitor		
Varanus pilbarensis	Pilbara Rock Monitor		
Varanus tristis	Black-headed Monitor		
Typhlopidae			
Anilios grypus			
Pythonidae			
Antaresia perthensis	Pygmy Python		
Antaresia stimsoni	Stimson's Python		
Aspidites melanocephalus	Black-headed Python		
Elapidae			
Brachyurophis approximans	North-western Shovel-nosed Snake		
Pseudechis australis	Mulga Snake		
Pseudonaja mengdeni	Western Brown Snake		
Suta fasciata	Rosen's Snake		

Amphibians

Family/Species	Common Name	Conservation Status	
		State	C'wealth
Pelodryadidae			
Cyclorana maini	Sheep Frog		
Litoria rubella	Little Red Tree Frog		
Limnodynastidae			
Platyplectrum spenceri	Centralian Burrowing Frog		
Myobatrachidae			
Uperoleia saxatilis	Pilbara Toadlet		

Appendix 6

Likelihood of Occurrence of Fauna of Conservation Significance

Species Name	Common Name	Conservation Status		NatureMap		EPBC PMS 20km	DBCA TFS 40km	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)	Preferred Habitat	Likelihood of Occurrence (Pre-survey)	Habitat Available in Survey Area?	Likelihood of Occurrence (Post-survey)
		State	C'Wealth	10km	20km											
MAMMALS																
Dasyurus hallucatus	Northern Quoll	EN	EN	✓	✓	✓	✓	✓	✓			✓	In the Pilbara region, primarily rocky areas and major drainage lines	Likely to occur	Yes	Likely to occur (probable track recorded)
Macrotis lagotis	Bilby, Dalgyte	VU	VU	✓	✓	✓	✓					✓	Acacia shrubland, open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas	Likely to occur	Yes	Likely to occur
Rhinonicteris aurantia (Pilbara Form)	Pilbara Leaf-nosed Bat	VU	VU	✓	✓	✓	✓		✓		✓		Reliant on roost sites in caves or mine adits with stable, very hot (28-32°C) and very humid (96-100%) microclimates. Forages over broad range of habitats.	Likely to occur	Yes (foraging)	Recorded
Macroderma gigas	Ghost Bat	VU	VU	✓	✓	✓	✓					✓	Occurs in a broad range of habitats, with their distribution being influenced by the availability of suitable caves and mines for roost sites	Likely to occur	Yes (foraging)	Likely to occur (recorded in close proximity)
Dasycercus blythi	Brush-tailed Mulgara, Ampurta	P4		✓	✓			✓				✓	Spinifex grasslands on sand plains and sandy swale between low dunes	Likely to occur	Marginal	May occur
Sminthopsis longicaudata	Long-tailed Dunnart	P4					✓	✓					Arid and rugged, rocky scree areas, including scree slopes, boulder and stony plateaus and adjacent stony plains with shrubs over spinifex hummock grassland	May occur	Yes	May occur
Lagorchestes conspicillatus leichardti	Spectacled Hare-wallaby	P4										✓	Sandy habitats with spinifex or low shrubbery	May occur	Marginal	May occur
Leggadina lakedownensis	Short-tailed Mouse	P4						✓				✓	Spinifex and tussock grasslands, primarily on cracking clays or sandy soils	May occur	Yes	May occur
Pseudomys chapmani	Western Pebble-mound Mouse	P4		✓	✓		✓	✓	✓		✓	✓	Stony hillsides with hummock grasslands.	Likely to occur	Yes	Recorded
BIRDS																
Pezoporus occidentalis	Night Parrot	CR	EN				✓						Old growth spinifex, often in association with samphire	May occur	Limited	May occur
Calidris ferruginea	Curlew Sandpiper	CR / MI	CR / MI			✓							Mudflats, saltmarshes, coastal and inland wetlands	Unlikely to occur	Marginal	Unlikely to occur
Rostratula australis	Australian Painted Snipe	EN	EN			✓							Wetlands and surrounds, usually vegetated freshwater wetlands	Unlikely to occur	Marginal	Unlikely to occur
Falco hypoleucos	Grey Falcon	VU	VU	✓	✓		✓		✓			✓	Lightly treed inland areas, sandridges, gibber deserts, pastoral land, timbered watercourses	Likely to occur	Yes	Likely to occur
Polytelis alexandrae	Princess Parrot	P4	VU				✓						Sand dunes and sand flats in the arid zone	Unlikely to occur	Marginal	Unlikely to occur
Plegadis falcinellus	Glossy Ibis	MI	MI		✓								Well-vegetated wetlands and floodplains, occasionally dry grasslands	May occur	Marginal	Unlikely to occur
Actitis hypoleucos	Common Sandpiper	MI	MI			✓							Coastal and inland wetlands	May occur	Marginal	Unlikely to occur
Calidris acuminata	Sharp-tailed Sandpiper	MI	MI	✓	✓	✓	✓						Coastal and inland wetlands	May occur	Marginal	Unlikely to occur
Calidris melanotos	Pectoral Sandpiper	MI	MI			✓							Shallow fresh waters	May occur	Marginal	Unlikely to occur

Species Name	Common Name	Conservation Status		NatureMap		EPBC PMS 20km	DBCA TFS 40km	Biota (2005)	Bamford (2013)	Astron (2014)	GHD (2016)	Biologic (2018)	Preferred Habitat	Likelihood of Occurrence (Pre-survey)	Habitat Available in Survey Area?	Likelihood of Occurrence (Post-survey)
		State	C'Wealth	10km	20km											
Tringa glareola	Wood Sandpiper	MI	MI	✓	✓		✓						Mudflats, muddy margins of wetlands	May occur	Marginal	Unlikely to occur
Tringa nebularia	Common Greenshank	MI	MI				✓						Mudflats, margins of fresh and saline wetlands	Unlikely to occur	Marginal	Unlikely to occur
Tringa stagnatilis	Marsh Sandpiper	MI	MI				✓						Margins of saline and freshwater wetlands	Unlikely to occur	Marginal	Unlikely to occur
Charadrius veredus	Oriental Plover	MI	MI		✓	✓							Open plains, bare, rolling country, muddy or sandy wastes near inland swamps or tidal mudflats; bare claypans, margins of coastal marshes; grassy airfields, sports fields, lawns and coastal dune areas	May occur	Yes	May occur
Gelochelidon nilotica	Gull-billed Tern	MI	MI		✓		✓						Wetlands and grasslands; coastal and inland	Unlikely to occur	Marginal	Unlikely to occur
Hydroprogne caspia	Caspian Tern	MI	MI				✓						Coastline and large inland wetlands	Unlikely to occur	No	Unlikely to occur
Chlidonias leucopterus	White-winged Black-Tern	MI	MI						✓				Coastal and inland wetlands	Unlikely to occur	Marginal	Unlikely to occur
Apus pacificus	Fork-tailed Swift	MI	MI	✓	✓	✓	✓						Thought to be exclusively aerial	Likely to occur	Yes	Likely to occur
Motacilla cinerea	Grey Wagtail	MI	MI			✓							A variety of habitats near water; vagrant	Unlikely to occur	Yes	Unlikely to occur
Motacilla tschutschensis	Eastern Yellow Wagtail	MI	MI			✓							Short grass and bare ground, swamp marshes	Unlikely to occur	Yes	Unlikely to occur
Hirundo rustica	Barn Swallow	MI	MI			✓							Open country with low vegetation, often near manmade structures	Unlikely to occur	Yes	Unlikely to occur
Falco peregrinus	Peregrine Falcon	OS		✓	✓		✓	✓				✓	Cliffs, gorges, timbered watercourses, plains, wetlands, open woodlands, buildings	Likely to occur	Yes	Likely to occur
REPTILES																
Ctenotus nigrilineatus	Pin-striped Finesnout Ctenotus	P1		✓	✓		✓					✓	Spinifex grasslands around granite outcrops	Likely to occur	Yes	Likely to occur
Anilios ganei	Gane's Blind Snake	P1										✓	A cryptic burrowing species, preferring moist soils	May occur	Yes	May occur
Liasis olivaceus barroni	Pilbara Olive Python	VU	VU	✓	✓	✓	✓		✓			✓	Rocky areas within the Pilbara, showing a preference for rocky gorges containing water in streams and rock pools	Likely to occur	Yes	Likely to occur

Appendix 7

Fauna License

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

FAUNA TAKING (BIOLOGICAL ASSESSMENT) LICENCE

Regulation 27, Biodiversity Conservation Regulations 2018

Licence Number: BA27000212

Licence Holder: Ms Penny Brooshooft
Biota Environmental Sciences
PO Box 155
Leederville WA 6903

Date of Issue: 18/02/2020

Date Valid From: 04/03/2020
Date of Expiry: 13/03/2020

LICENSED ACTIVITIES

Subject to the terms and conditions on this licence, the licence holder may –

1. Take and disturb fauna for level 1 fauna survey for environmental impact assessment using baited remote sensing cameras, ultrasonic bat detector spotlighting, secondary signs / evidence, habitat assessment and aural survey for Main roads WA Marble Bar road upgrade.

LOCATIONS

1. Nullagine Marble Road from Roy Hill Mine, located at Straight Line Kilometre (SLK) 97 to SLK 179 (a length of approximately 115 km).

AUTHORISED PERSONS

The following persons or persons of the specified class may assist in carrying out the licensed activities:

1. Stewart Ford
2. John Graff
3. Jacinta King
4. Victoria Ford
5. Michael Greenham
6. Daniel Kamien
7. Joshua Keen
8. Sylvie Schmidt
9. Nathan Beerkens

CONDITIONS

1. Fauna must not be taken on CALM land, (as defined in the Conservation and Land Management Regulations 2002*),* unless authorised by a written notice of a lawful authority issued under regulations 4 and 8 of the Conservation and Land Management Regulations 2002.
2. If persons, other than the licence holder, are authorised to carry out/assist in carrying out the activities under the licence, the licence holder must ensure those persons have read and understand the licence terms and conditions.

3. The written authorisation of the person in possession or occupation of the land accessed and upon which fauna is taken, as required under regulation 101(2) and referred to in "Additional information" below, must:
   a) state location details (including lot or location number, street/road, suburb and local government authority);
   b) state land owner or occupier name, and contact phone number;
   c) specify the time period that the authorisation is valid for;
   d) be signed and dated; and
   e) be attached to this licence at all times.
4. This licence, and any written authorisation or lawful authority which authorises the take of fauna on specified locations must be carried at all times while conducting licensed activities and be produced on demand by a wildlife officer.
5. If a species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* is inadvertently captured, that species is to be released immediately at the point of capture. If the fauna is injured or deceased, the licence holder shall contact the DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) for advice on treatment or disposal. Details of any capture of threatened fauna must be included in the "Return of Fauna Taken."
6. The licence holder must not:
   a) release any fauna in any area where it does not naturally occur;
   b) transfer fauna to any other person or authority (other than the Western Australian Museum) unless approved in writing by the CEO; or
   c) dispose of the remains of fauna in any manner likely to interfere the natural or present day distribution of the species.
7. The licence holder must not take and remove more than ten specimens of any one protected species of fauna from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
8. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
9. All specimens and material retained under the authority of this licence must be offered to the Western Australian Museum for loan, for inclusion in its collection, or on request be made available to other persons involved in relevant scientific studies.
10. The licence holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken" of all fauna taking activities as they occur.
11. A DBCA approved "Return of Fauna Taken" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) prior to the end of each annual period of the licence (from the valid from date) (refer to "Additional Information" section below).

Danny Stefoni
LICENSING OFFICER
WILDLIFE PROTECTION BRANCH

Delegate of CEO

ADDITIONAL INFORMATION

1. It is an offence to take any species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* unless the person is authorised under Section 40. The penalty ranges between $300 000 and $500 000; Section 150 Biodiversity Conservation Act 2016.
2. Regulation 82 empowers the CEO to add, substitute or delete a term or condition of a licence or to correct errors. Such power may be exercised on application of a licence holder or by the CEO's own initiative. If an amendment to a licence term or condition is required, please contact the CEO or the Licensing Section on wildlifelicensing@dbca.wa.gov.au in the first instance. The licence holder, if adversely affected by a condition imposed in this licence, may apply to the State Administrative Tribunal for review of the decision of the CEO to impose that condition on a licence: regulation 89(2) Biodiversity Conservation Regulations 2018.
3. A person must not contravene a condition of a licence. The penalty for an offence involving the contravention of a condition of a licence is a fine of $10 000: regulation 84 of the Biodiversity Conservation Regulations 2018.
4. It is an offence for persons authorised by this licence to enter land that is not in their possession or under their control without first having the *prior* written authorisation of the current owner or occupier of the land to:

   a) enter the land; and

   b) carry out the activity authorised by this licence.

   The penalty for this offence is a fine of $5 000: regulation 101(2) of the Biodiversity Conservation Regulations 2018.
5. The licence holder must be able to produce for inspection upon request any information or records required by regulation 85(2) of the Biodiversity Conservation Regulations 2018 Penalty $10 000. It is an offence to knowingly include false or misleading information or make statements in records: regulation 85(3) of the Biodiversity Conservation Regulations 2018 Penalty $10 000. It is an offence to include any information or make any statement in a return that the licence holder knows to be false or misleading in a material particular: regulation 86 (2) of the Biodiversity Conservation Regulations 2018 Penalty $10 000.
6. The approved DBCA "Return of Fauna Taken" data file can be downloaded from the DBCA webpage (https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities).
7. The issuing of a licence under the Biodiversity Conservation Regulations 2018 does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002,* Animal Welfare (Scientific Purposes) Regulations 2003. It is the responsibility of a licence applicant / licence holder to ensure that they comply with the requirements of all applicable legislation. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be

directed to the Department of Primary Industries and Regional Development (https://www.agric.wa.gov.au/animalwelfare).

8. Threatened fauna can only be taken under a *Biodiversity Conservation Act 2016* Section 40 authorisation, Occurrences of threatened species must be reported to the CEO. For more information please see https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals.

9. Any interaction involving Nationally Listed Threatened Fauna that may be invasive and/or harmful to the fauna may require approval from the Commonwealth Department of the Environment and Energy http://www.environment.gov.au/about-us/business-us/permits-assessments-licences. Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018.

Appendix 8

Vegetation Structural Classification and Condition Ranking

Vegetation structural classes based on modifications of the vegetation classification system of Specht (1970) by Muir (1977) and Aplin (1979).

Stratum	**Canopy Cover (%)**				
	70-100%	**30-70%**	**10-30%**	**2-10%**	**<2%**
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Shrubs over 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs under 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, Sedges, Herbs	Closed tussock grassland / bunch grassland / sedgeland / herbland	Tussock grassland / bunch grassland / sedgeland / herbland	Open tussock grassland / bunch grassland / sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	Scattered tussock grasses / bunch grasses / sedges / herbs

Extracts from the NVIS framework (see NVIS Technical Working Group 2017) of relevance to the current study.

Table 1: The NVIS Information Hierarchy.

Hierarchical Level	Description	NVIS structural/floristic components required
I	**Class***	Dominant growth form for the ecologically or structurally dominant stratum
II	**Structural Formation***	Dominant growth form, cover and height for the ecologically or structurally dominant stratum.
III	**Broad Floristic Formation****	Dominant growth form, cover, height and dominant land cover genus for the upper most or the ecologically or structurally dominant stratum.
IV	**Sub-Formation****	Dominant growth form, cover, height and dominant genus for each of the three traditional strata. (i.e. Upper, Mid and Ground)
V	**Association****	Dominant growth form, height, cover and species (3 species) for the three traditional strata. (i.e. Upper, Mid and Ground)
VI	**Sub-Association****	Dominant growth form, height, cover and species (5 species) for all layers/sub-strata.

* Walker & Hopkins (1990)
** NVIS (defined for the NVIS Information Hierarchy)

Table 4: NVIS structural Formation Terminology.

	Cover Characteristics							
	Foliage cover *	70-100	30-70	10-30		» 0	0-5	unknown
	Crown cover **	>80	50-80	20-50	0.25-20		0-5	unknown
	% Cover ***	>80	50-80	20-50	0.25-20		0-5	unknown
	Cover code	d	c	i	r	bi	bc	unknown
Growth Form	**Height Ranges (m)**	**Structural Formation Classes**						
tree, palm	30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
shrub, cycad, grass-tree, tree-fern	2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
heath shrub	2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
tussock grass	0.5	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grasses	isolated clumps of tussock grasses	tussock grasses
other grass	0.5	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
sedge	0.5	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
rush	0.5	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
forb	0.5	closed forbland	forbland	open forbland	sparse forbland	isolated forbs	isolated clumps of forbs	forbs
fern	2	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
vine	30	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines

* Foliage Cover is defined for each stratum as 'the proportion of the ground that would be shaded if sunshine came from directly overhead'. It includes branches and leaves and is similar to the Crown type of Walker & Hopkins (1990) but is applied to a stratum or plot rather than an individual crown. It is generally not directly measured in the field for the upper stratum, although it can be

measured by various line interception methods for ground layer vegetation. For the attribute COVER CODE in the Stratum table, the ground cover category refers to ground foliage cover not percentage cover.
** Crown Cover (canopy cover) as per Walker & Hopkins (1990). Although relationships between the two are dependent on season, species, species age etc (Walker & Hopkins (1990), the crown cover category classes have been adopted as the defining measure.
*** The percentage cover is defined as the percentage of a strictly defined plot area, covered by vegetation. This can be an estimate and is a less precise measure than using, for example, a point intercept transect methods on ground layer, or overstorey vegetative cover. That is for precisely measured values (e.g. crown densitometer or point intercept transects) the value measured would be 'foliage' cover. Where less precise or qualitative measures are used these will most probably be recorded as 'percentage' cover.

Table 6: Example usage of the NVIS Information Hierarchy (Note: For definitions of U, M, G, U1, U2, U3, M1, M2, M3, G1, and G2 refer to Table 1.)**

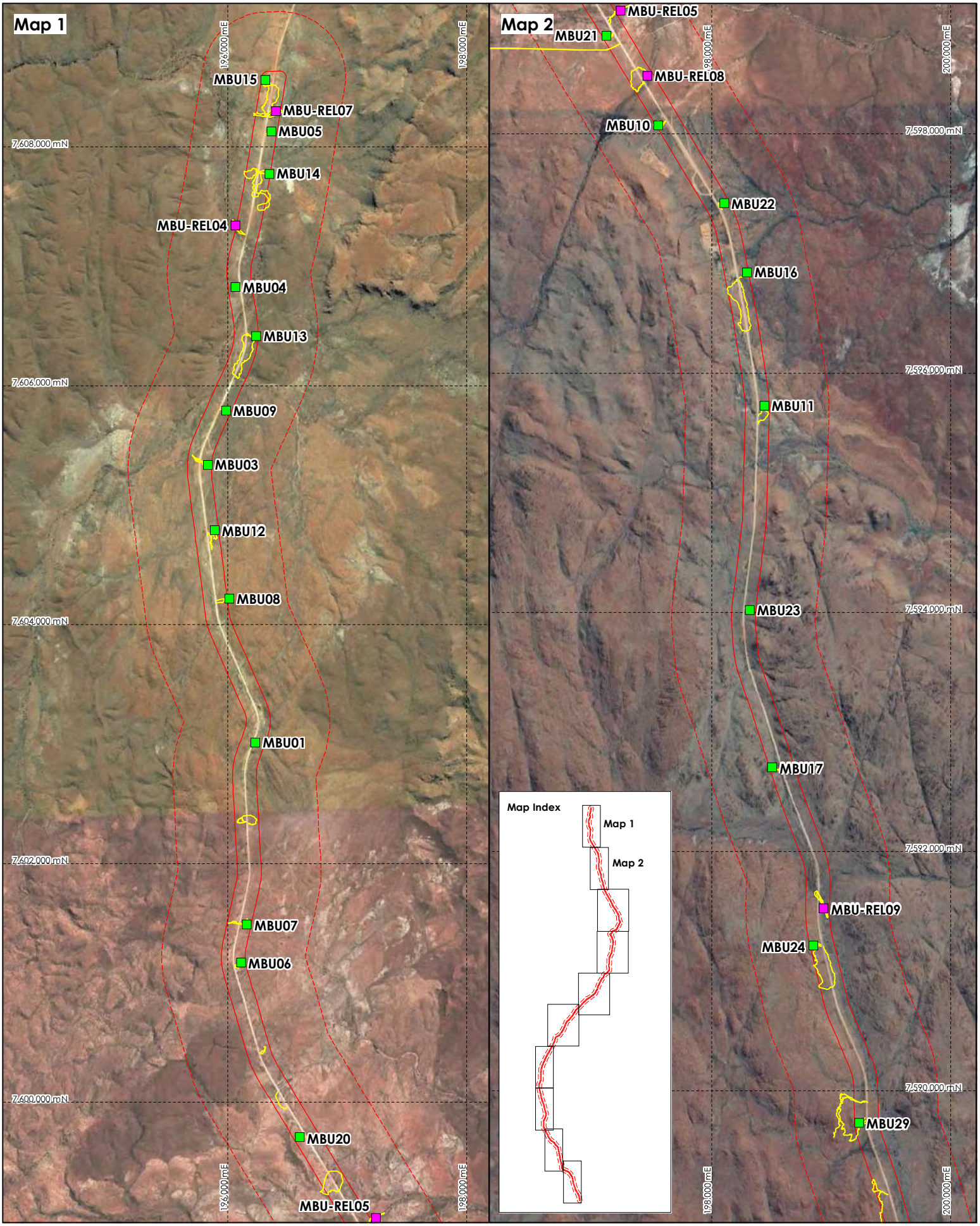
Level	Description	Species	Growth form	Cover	Height
I	**CLASS**	-	1 dominant growth form for the dominant stratum	-	-
	Example	*Tree*			
II	**STRUCTURAL FORMATION**	-	1 dominant growth form for the dominant stratum	1 cover class for the dominant stratum	1 height class for the dominant stratum
	Example	*Open woodland*			
III	**BROAD FLORISTIC FORMATION**	1 dominant genus name for the dominant stratum	1 dominant growth form for dominant stratum	1 cover class for dominant stratum	1 height class for dominant stratum
	Example	*Eucalyptus open woodland*			
IV	**SUB-FORMATION**	1 dominant genus name for each stratum ((max 3 strata; i.e. for U, M, G where substantially present)	1 dominant growth form for each stratum (max 3 strata)	1 cover class for each stratum (max 3 strata)	1 height class for each stratum (max 3 strata)
	Example	*+Eucalyptus open woodland\Acacia tall sparse shrubland\Aristida open tussock grassland*			
V	**ASSOCIATION**	Up to 3 dominant species for each stratum (max 3 strata; i.e. for U, M, G where present)	Up to 3 dominant growth forms for each stratum (max 3 strata; i.e. for U, M, G where present)	1 cover class code for each stratum (max 3 strata; i.e. for U, M, G where present)	1 height class code for each stratum (max 3 strata; i.e. for U, M, G where present)
	Example	*U+ ^Eucalyptus coolabah,Casuarina cristata,Flindersia maculosa\^tree\7\r;M ^Acacia salicina,Alectryon oleifolius,Acacia stenophylla\^shrub\4\r;G ^Aristida ramosa,Astrebla squarrosa,Bothriochloa decipiens\^tussock grass,forb,sedge\2\i*			
VI	**SUB-ASSOCIATION**	Up to 5 dominant species for each sub-stratum (i.e. for U1, U2, U3, M1, M2, M3, G1, G2 where present) • Indicate characteristic genus in each sub-stratum with an up arrow or hat "^". Must match characteristic growth form.	Up to 5 dominant growth forms for each sub-stratum. • Indicate characteristic growth form with an up arrow or hat "^". Must match characteristic genus	1 cover class code for each sub-stratum	1 height class code for each sub-stratum
	Example	*U1+ ^Eucalyptus coolabah,Casuarina cristata,Flindersia maculosa\Eucalyptus\^tree\7\r;M1 ^Acacia salicina,Alectryon oleifolius ,Acacia stenophylla,Acacia victoriae subsp. victoriae,Eremophila bignoniiflora\Acacia\^shrub\4\bi;M2 Eremophila longifolia,Muehlenbeckia florulenta\Eremophila\shrub\3\r;G1 ^Aristida ramosa,Astrebla squarrosa,Bothriochloa decipiens,Dichanthium sericeum,Enteropogon acicularis\Aristida\^tussock grass,forb,sedge\2*			

Vegetation condition scale taken from EPA (2016a), based on scales developed by Keighery (1994) and Trudgen (1988).

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 9

Botanical Sampling Effort



Location Map



Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

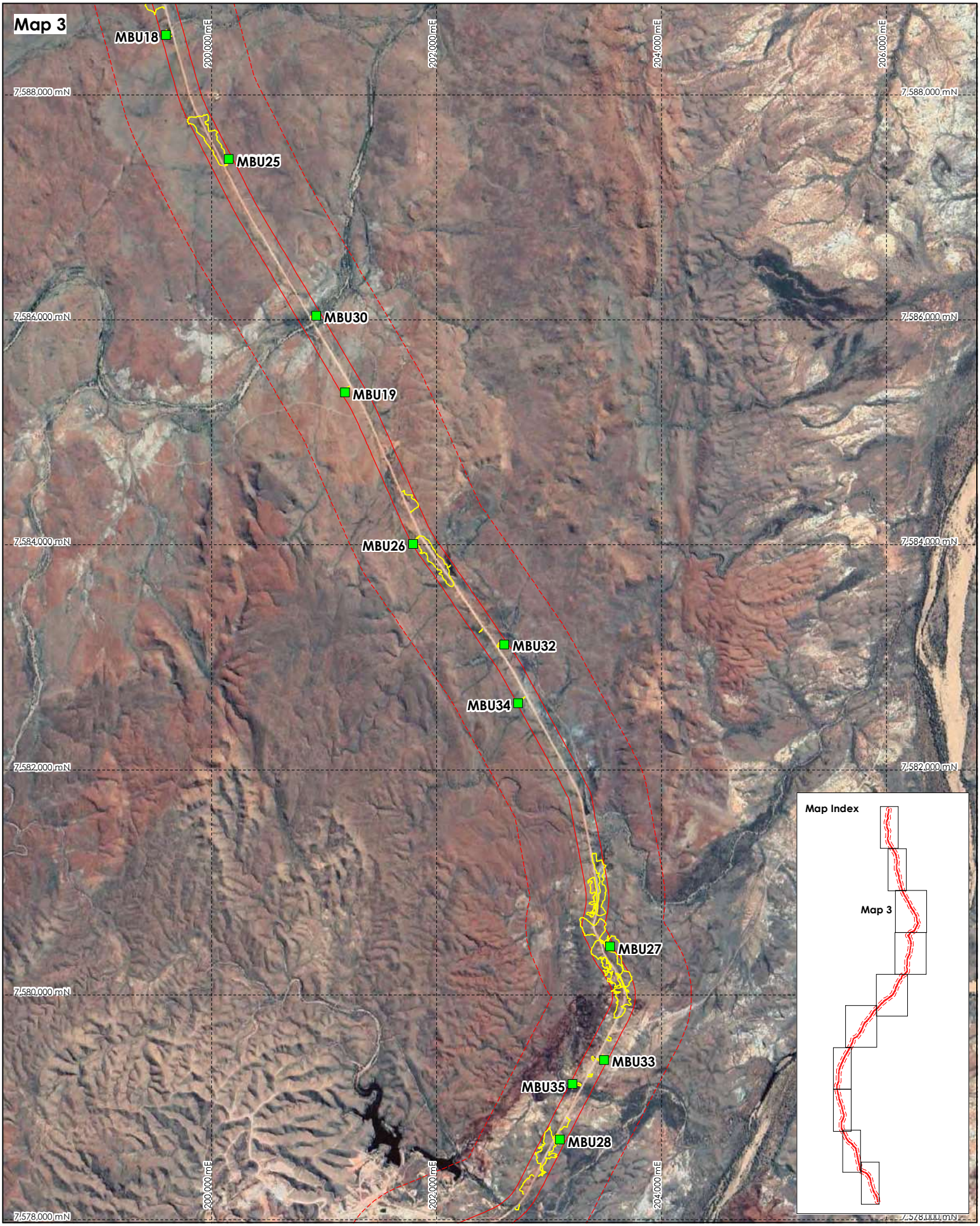
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

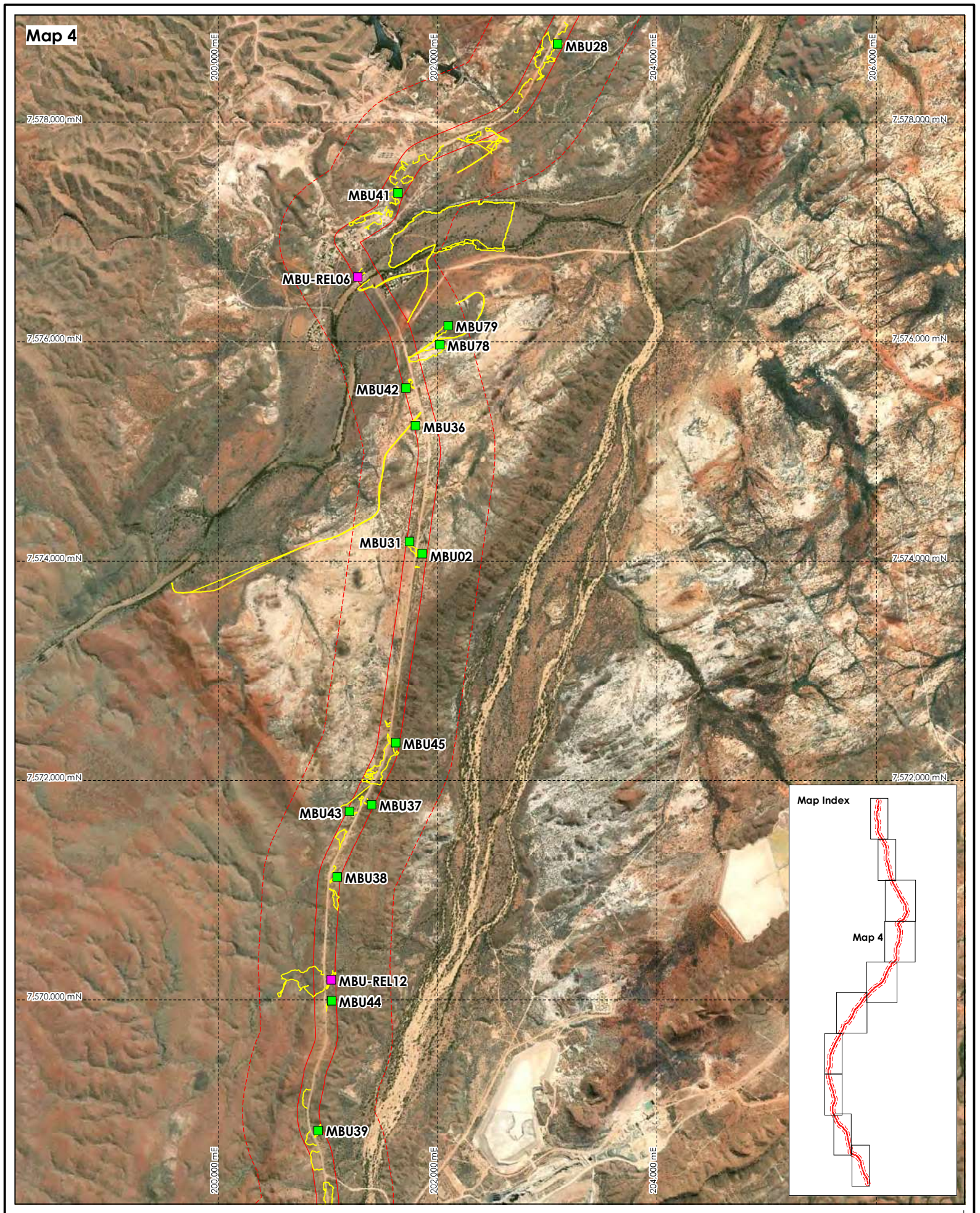
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map



Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

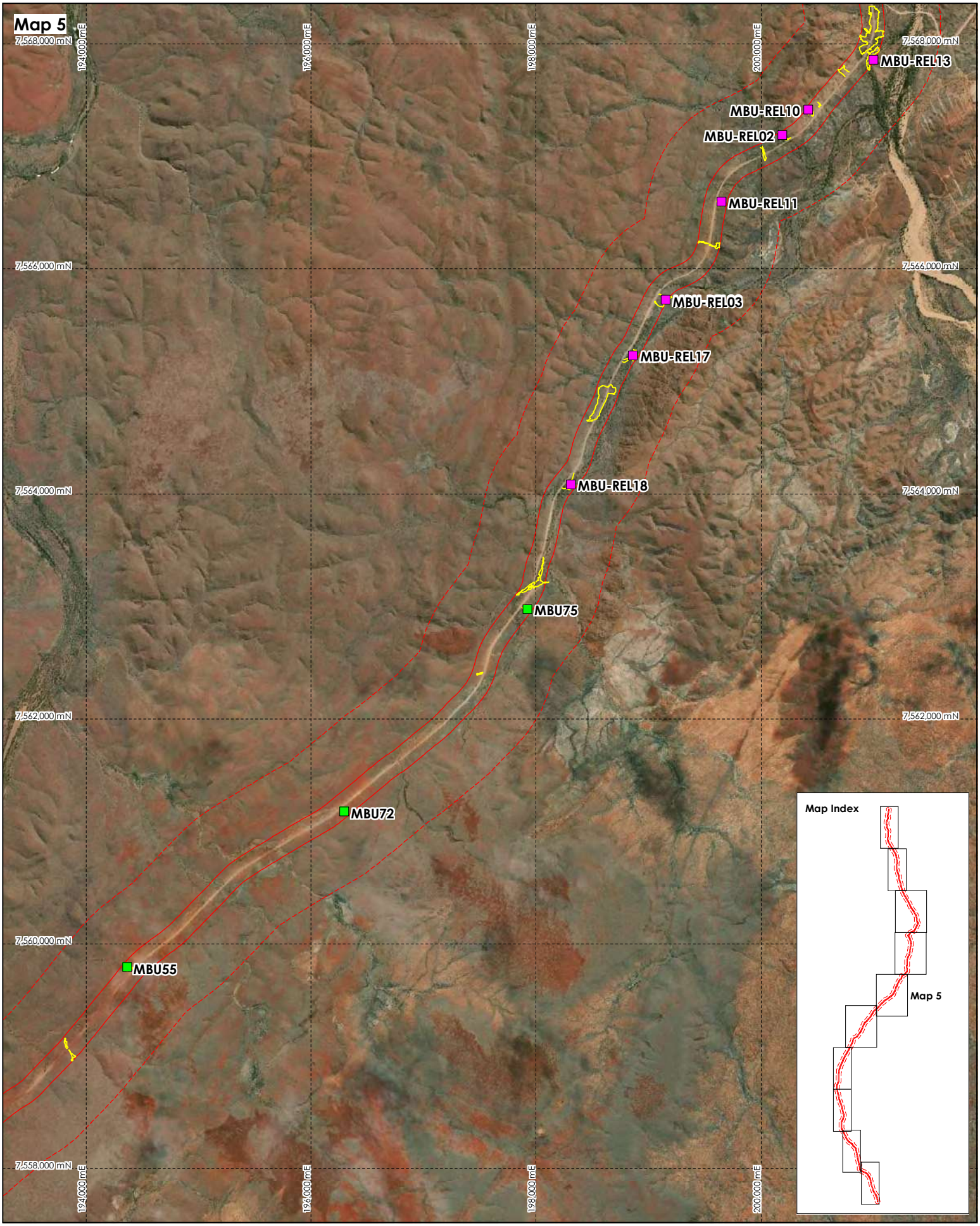
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

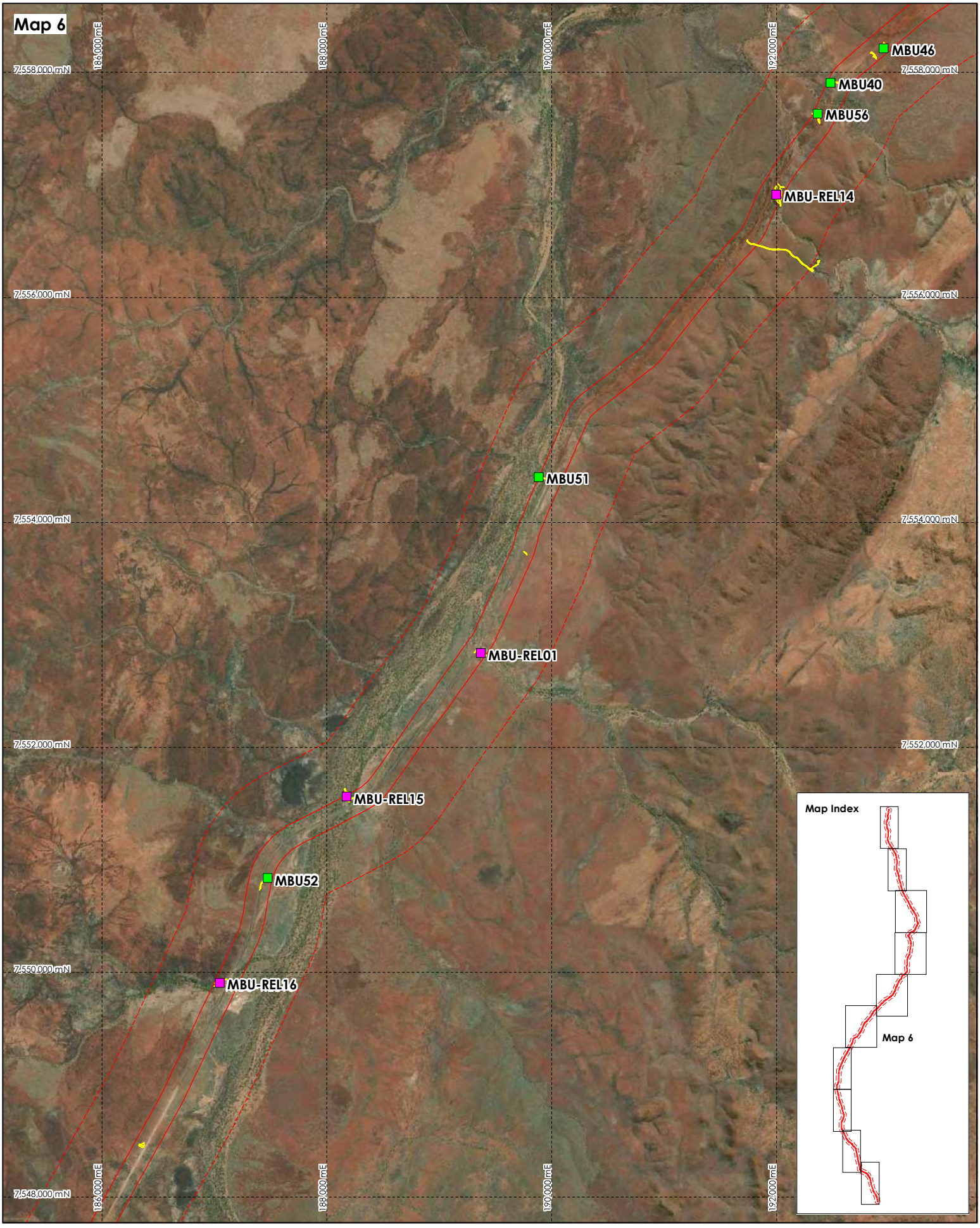
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

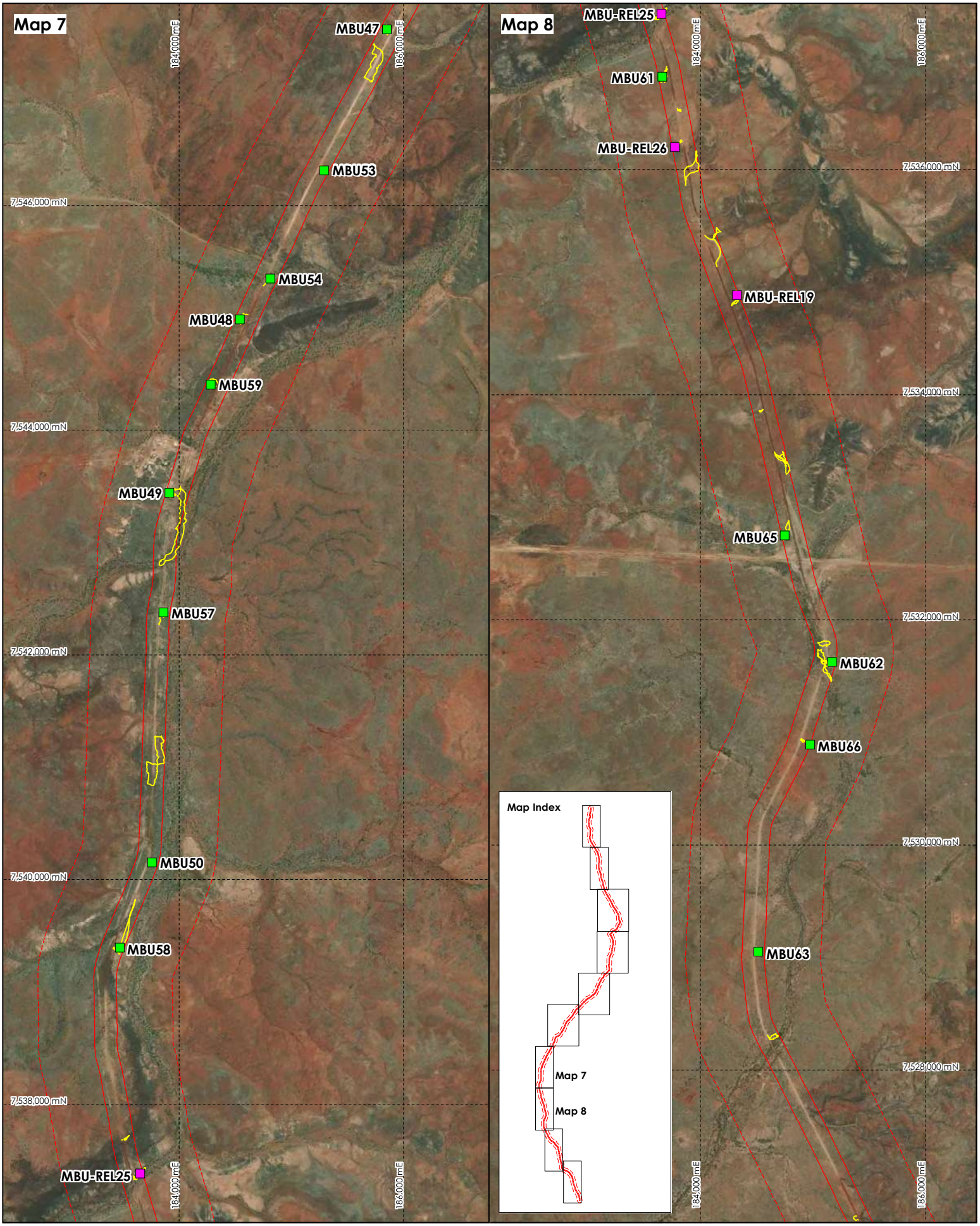
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

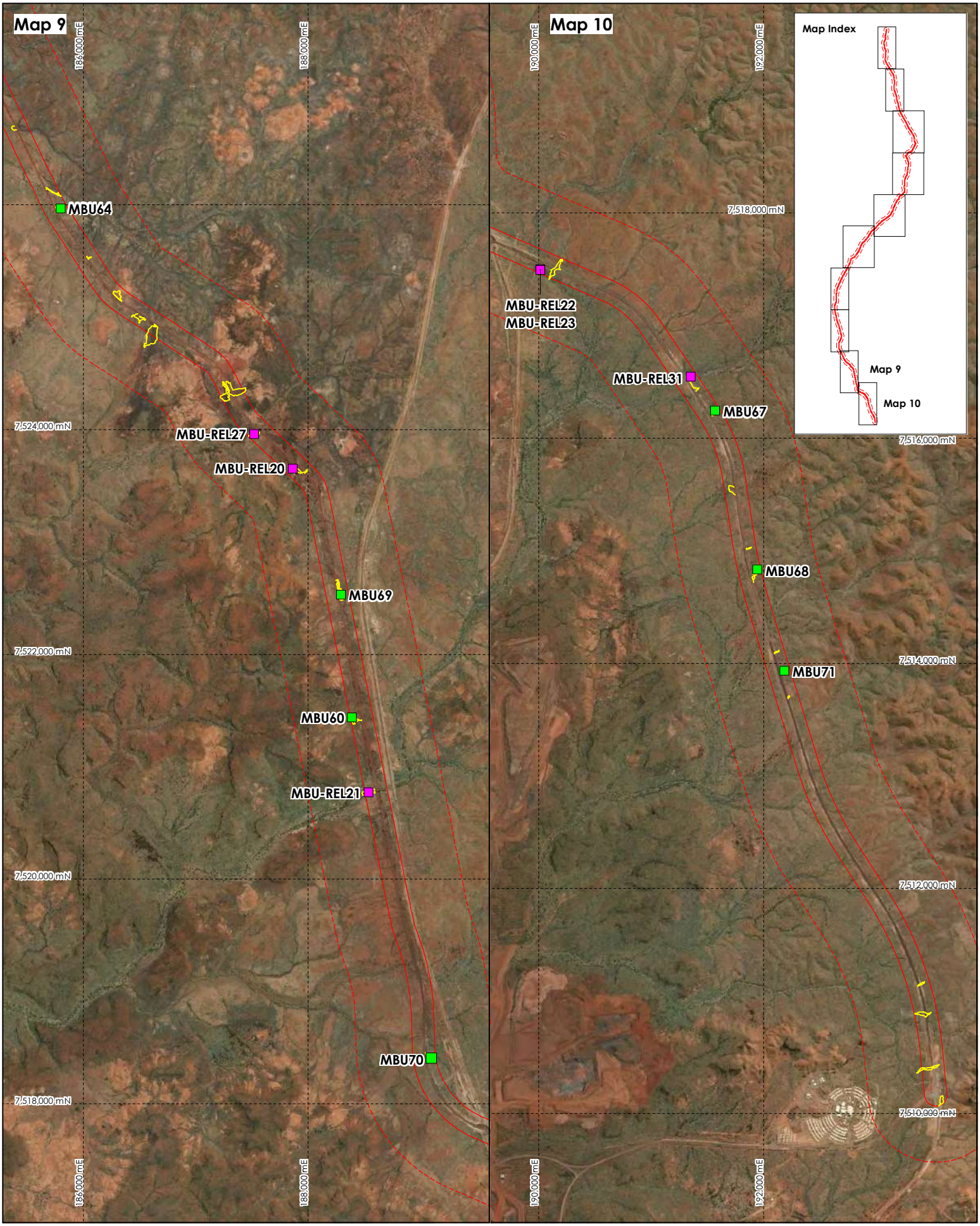
0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map



Survey area

Contextual area

Foot traverse

Quadrat site location

Relevé site location

N

0 1 2

kilometres

Marble Bar Road Upgrade
Flora Survey Effort

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: 04 Nov 2020 | Projection: MGA Z51 (GDA94) | Scale: 1:42,500

Appendix 10

Flora Site Data and Photographs

NB. All Cover values presented as %; Heights presented in cm.

Marble Bar Rd Upgrade		**Site**	MBU01		
Described by	AL,MET	**Date**	05-Mar-20	**Type**	Quadrat 80 x 15 m
MGA Zone	51	196241 mE, 7603051 mN		120.065286°E, -21.649831°S	
Habitat	Moderately steep slope on ridge; W-facing.				
Soil	Reddish brown sandy loam.				
Rock Type	Hardey Formation; sandstone.				
Vegetation	*Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia orthocarpa, Indigofera monophylla* low shrubland over *Triodia epactia* hummock grassland.				
Veg Condition	Excellent.				
Fire Age	No sign of recent fire.				

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	20	MBU01-06	Juvenile; light green phyllodes.
Acacia orthocarpa	15	90	MBU01-05	Grey shrub. PLDK: Bushy form.
Acacia pyrifolia var. *pyrifolia*	0.1	300	MBU01-21	Slender shrub, slightly pruinose.
Aristida contorta	0.1	35	MBU01-19	
Arivela viscosa	0.1	10	MBU01-10	
Bonamia pilbarensis	0.1	10	MBU01-20	
Bulbostylis barbata	0.1	4	MBU01-12	
Corchorus parviflorus	0.1	35	MBU01-13	Leaves whitish.
Eriachne pulchella	0.1	15	MBU01-17	
Euphorbia trigonosperma	0.1	15	MBU01-26	
Gossypium australe	0.1	5	MBU01-11	Burrup Peninsula form: greener indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	300	MBU01-04	
Heliotropium skeleton	0.1	50	MBU01-14	Flowers white.
Indigofera monophylla	9	80	MBU01-02	Grey leaves. PLDK: sens. lat.; type 3 (small leaf 15 x 10 mm, small inconspicuous stipule; hairs partly appressed, partly dendritic upright).
Oldenlandia crouchiana	0.1	3	MBU01-08	Leaves fleshy. PLDK: sens. lat.
Ptilotus aervoides	0.1	2	MBU01-09	
Ptilotus fusiformis	0.1	30	MBU01-07	
Senna artemisioides subsp. *oligophylla*	0.1	110	MBU01-22	
Senna glutinosa subsp. *glutinosa*	0.1	130	MBU01-25	Sticky.
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	5	MBU01-16	Juvenile. Ferruginous form.
Solanum horridum	0.1	10	MBU01-03	Light green leaves.
Solanum phlomoides	0.1	45	MBU01-18	Leaves pale green, thick tomentose.
Tribulus platypterus	0.1	50	MBU01-24	
Tribulus suberosus	0.1	130	MBU01-23	
Triodia epactia	40	35	MBU01-01	Green leaves; heads to 90 cm. PLDK: sens. lat.
Yakirra australiensis var. *australiensis*	0.1	5	MBU01-15	Juvenile.



Marble Bar Rd Upgrade **Site** MBU02

Described by RW,SC,MET **Date** 04-Mar-20 **Type** Quadrat 40 x 60 m

MGA Zone 51 201844 mE, 7574099 mN 120.114139°E, -21.912020°S

Habitat Gentle mid slope (W-facing).

Soil Reddish brown (2.5YR 4/4) fine sandy loam.

Rock Type Mosquito Creek Formation; quartz.

Vegetation *Triodia longiceps* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Evidence of ponding and minor channels; possible old track acting as channel. Patches of *Acacia bivenosa*. Small patches of *Triodia brizoides* outside corridor.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	105	MBU02-02	PLDK: sens. lat.
Aristida contorta	0.1	10	MBU02-14	
Bonamia pilbarensis	0.1	20	MBU02-08	
Cassytha capillaris	0.1	40	MBU02-12	
Corchorus parviflorus	0.1	40	MBU02-04	
Enneapogon polyphyllus	0.1	15	MBU02-16	PLDK: sens. lat.
Eriachne pulchella	0.1	5	MBU02-20	Sens lat.
Goodenia microptera	0.1	35	MBU02-18	
Goodenia muelleriana	0.1	15	MBU02-13	
Hakea lorea subsp. *lorea*	0.1	20	MBU02-19	Taller tree to 380 just outside quadrat.
Haloragis gossei var. *gossei*	0.1	2	MBU02-15	Seedling; variety assigned based on other fruiting specimens.
Heliotropium chrysocarpum	0.1	20	MBU02-23	
Indigofera monophylla	0.1	55	MBU02-09	PLDK: sens. lat.
Maireana carnosa	0.1	10	MBU02-07	M Hislop (WAH): Tentative ID of sterile specimen.
Maireana melanocoma	0.1	50	MBU02-05	
Ptilotus astrolasius	0.1	35	MBU02-11	
Sclerolaena densiflora	0.1	30	MBU02-06	PLDK: sens. lat.
Senna symonii	0.1	80	MBU02-03	
Sporobolus australasicus	0.1	2	MBU02-10	
Trianthema triquetrum	0.1	10	MBU02-21	
Tribulus sp.	0.1	2	MBU02-17	Inadequate material; seedling.
Triodia longiceps	35	80	MBU02-01	



Marble Bar Rd Upgrade **Site** MBU03

Described by AL,MET **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 195806 mE, 7605360 mN 120.061510°E, -21.628922°S

Habitat Gentle slope in valley floor.

Soil Reddish brown silty clay.

Rock Type Hardey Formation; sandstone.

Vegetation *Hakea lorea* subsp. *lorea,* (*Grevillea pyramidalis* subsp. *leucadendron, Acacia bivenosa*) scattered shrubs over *A. trachycarpa* scattered low shrubs over *Triodia wiseana* open hummock grassland.

Veg Condition Very Good: some cattle scats.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	120	MBU01-06=	PLDK: sens. lat.
Acacia trachycarpa	0.1	80	MBU03-14	
Alysicarpus muelleri	0.1	10	MBU03-12	
Aristida contorta	0.1	15	MBU03-15	
Arivela viscosa	0.1	3		Juvenile.
Boerhavia coccinea	0.1	15	MBU03-18	Ascending. Sens. lat.
Bulbostylis barbata	0.1	4	MBU03-07	
Chrysopogon fallax	0.1	80	MBU03-27	Panicle to 1.3m tall.
Corchorus parviflorus	0.1	50	MBU03-09	Stems woolly; grey and red.
Cucumis variabilis	0.1	12	MBU03-24	50 cm across. Indumentum atypical (coarse, dense); leaves broad.
Dichanthium sericeum subsp. *humilius*	0.1	6	MBU03-10	
Enneapogon caerulescens	0.1	10	MBU03-17	
Euphorbia australis var. *subtomentosa*	0.1	5	MBU03-8,20	Annual; grey leaves.
Euphorbia trigonosperma	0.1	6	MBU03-05	
Evolvulus alsinoides	0.1	5	MBU03-19	Sterile; var. not determined.
Goodenia microptera	0.1	14	MBU03-21	
Goodenia muelleriana	0.1	10	MBU03-16	
Gossypium australe	0.1	35	MBU01-11=	Burrup Peninsula form: greener indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	130		Fire affected.
Hakea lorea subsp. *lorea*	0.1	180		Fire affected.
Heliotropium cunninghamii	0.1	10	MBU03-06	.
Heliotropium pachyphyllum	0.1	25	MBU03-22	Sprawling perennial.
Indigofera linifolia	0.1	5		
Indigofera linnaei	0.1	3	MBU03-13	
Portulaca oleracea/intraterranea	0.1	5	MBU03-04	PLDK: seeds faintly nippled.
Senna artemisioides subsp. *helmsii*	0.1	45	MBU03-11	
Senna artemisioides subsp. *oligophylla*	0.1	25	MBU03-23	
Sida echinocarpa	0.1	25	MBU03-02	Juvenile; whitish leaves.
Sporobolus australasicus	0.1	10	MBU03-03	
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	25	MBU03-29	Orange flowers. PLDK: atypical indumentum, R. Butcher.
Tribulus sp.	0.1	5	MBU03-25	Inadequate material; seedling
Trigastrotheca molluginea	0.1	8		
Triodia wiseana	22.5	35	MBU03-01	PLDK: sens. lat.; long lemma lobe form.
Tripogonella loliiformis	0.1	8	MBU03-28	N=5.



Marble Bar Rd Upgrade **Site** MBU04

Described by AL,MET **Date** 05-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 196047 mE, 7606859 mN 120.064109°E, -21.615438°S

Habitat Hill slope; E-facing.

Soil Reddish brown silty clay; soil being calcretized.

Rock Type Volcanic; vesicular basalt.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Very Good: Small amount of **Cenchrus*; some cattle scats, some grazing (on **Cenchrus*).

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	80	MBU04-28	PLDK: sens. lat.
Acacia bivenosa	1	120	MBU01-06=	PLDK: sens. lat.
Acacia inaequilatera	0.1	220	MBU04-04	
Acacia trachycarpa	0.1	100	MBU04-18	Minniritchi bark.
Bonamia pilbarensis	0.1	6	MBU04-11	
**Cenchrus ciliaris*	0.1	25		Grazed.
Corchorus parviflorus	0.1	20	MBU04-06	
Corymbia hamersleyana	0.5	700	MBU04-01	Sens. lat.
Enneapogon caerulescens	0.1	20	MBU04-23	
Enneapogon robustissimus	0.1	27	MBU04-27	
Eragrostis desertorum	0.1	60	MBU04-10	Perennial tussock. Heads to 60cm.
Euphorbia careyi	0.1	10	MBU04-14	Cyathia yellow.
Evolvulus alsinoides var. *villosicalyx*	0.1	25	MBU04-22	
Gossypium australe	0.1	30	MBU04-25A	Whim Creek form: greyer indumentum.
Heliotropium cunninghamii	0.1	5	MBU04-16	Flowers white with yellow centre.
Hibiscus coatesii	0.1	10	MBU04-21	Fruiting.
Hibiscus sturtii var. *campylochlamys*	0.1	15	MBU04-07	
Hybanthus aurantiacus	0.1	40	MBU04-25	PLDK: sens. lat.
Indigofera monophylla	0.1	25	MBU04-08	Narrow leaves. PLDK: sens. lat.
Indigofera monophylla	0.1	35	MBU04-09	Broad leaves.
Paraneurachne muelleri	0.1	35		
Ptilotus clementii	0.1	35	MBU04-13	Flowers pale green.
Rhynchosia minima	0.1	30	MBU04-02	Flowers yellow.
Senna artemisioides subsp. *oligophylla*	0.1	100	MBU04-17	Leaflets slightly pruinose.
Senna glutinosa subsp. *glutinosa*	0.1	85	MBU04-19	
Senna symonii	0.1	70		Juvenile.
Sida echinocarpa	0.1	25	MBU04-20	Light green leaves.
Sida fibulifera	0.1	15	MBU04-03	PLDK: sens. lat.
Tephrosia rosea var. *clementii*	0.1	20	MBU04-24	Leaflets silvery.
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	25	MBU04-12, -15	Perennial; flowers orange.
Themeda triandra	0.1	26	MBU04-26	
Triodia wiseana	40	60	MBU04-05	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU05
Described by AL,MET **Date** 05-Mar-20 **Type** Quadrat 60 x 40 m
MGA Zone 51 196348 mE, 7608159 mN 120.067250°E, -21.603759°S
Habitat Plain.
Soil Reddish brown sandy loam.
Rock Type Colluvium.
Vegetation *Triodia wiseana* hummock grassland.
Veg Condition Very Good.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	200	MBU01-06=	PLDK: sens. lat.
Acacia inaequilatera	0.1	100	MBU05-12	
Acacia orthocarpa (wispy form)	0.1	6	MBU05-25	
Acacia synchronicia	0.1	180	MBU05-03	PLDK: sens. lat.
Alysicarpus muelleri	0.1	5	MBU05-05	
Aristida contorta	0.1	10		
Arivela viscosa	0.1	4		Juvenile.
Corchorus incanus subsp. *incanus*	0.1	15	MBU05-22	
Corchorus parviflorus	0.1	45	MBU05-15	
Corymbia hamersleyana	0.1	700	MBU04-01=	Sens. lat.
Dichanthium sericeum subsp. *humilius*	0.1	5	MBU05-08	
Enneapogon caerulescens	0.1	20	MBU05-07, -27	
Eragrostis desertorum	0.1	30	MBU04-10=	
Eriachne pulchella	0.1	10	MBU05-04	
Euphorbia australis var. *subtomentosa*	0.1	5	MBU05-23	Erect to spreading.
Euphorbia trigonosperma	0.1	12	MBU05-18	Stems arching.
Euphorbia vaccaria var. *vaccaria*	0.1	1	MBU05-19	Prostrate.
Goodenia muelleriana	0.1	7	MBU05-09	Sens. lat.
Gossypium australe	0.1	20		Juvenile. Burrup Peninsula form: greener indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	140		
Heliotropium cunninghamii	0.1	15	MBU05-16	Flowers white with yellow centre.
Indigofera colutea	0.1	7	MBU05-24	Annual. Juvenile.
Pluchea tetranthera	0.1	30		
Polygala glaucifolia	0.1	7	MBU05-14	
Polymeria ambigua	0.1	2	MBU05-21	Juvenile.
Portulaca oleracea/intraterranea	0.1	2		
Ptilotus astrolasius	0.1	40		
Rhynchosia minima	0.1	20	MBU05-10, -11	
Senna artemisioides subsp. *helmsii*	0.1	30	MBU05-17	
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	190	MBU05-02	MET det.
Sida clementii	0.1	30	MBU05-20A	Leaves white tomentose.
Sida echinocarpa	0.1	23	MBU05-20B	
Sporobolus australasicus	0.1	5		
Tribulus hirsutus	0.1	12	MBU05-13	
Triodia wiseana	40	60	MBU05-01	PLDK: sens. lat.; long lemma lobe form.
Yakirra australiensis var. *australiensis*	0.1	5	MBU05-06	



Marble Bar Rd Upgrade **Site** MBU06
Described by AL,MET **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 196086 mE, 7601198 mN 120.063452°E, -21.666524°S
Habitat Gentle SE-facing slope with outcropping, below a ridge.
Soil Reddish brown sandy clay loam.
Rock Type Hardey Formation; sandstone; sheet outcrop comprises 15% of quadrat.
Vegetation *Acacia eriopoda* open shrubland over *Triodia epactia* open hummock grassland.
Veg Condition Excellent to Very Good: cattle scats and track.
Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	45	MBU01-06=	PLDK: sens. lat.
Acacia eriopoda	10	200	MBU06-03	PLDK: leaves longer; marginal veins.
Acacia inaequilatera	0.1	20	MBU06-18	Post-fire regrowth.
Acacia orthocarpa (wispy form)	0.1	300		
Aristida contorta	0.1	20		
Bonamia pilbarensis	0.1	4	MBU06-14	
Bulbostylis barbata	0.1	3	MBU06-21	
Cassytha capillaris	0.1	100	MBU06-33	Corollas white, fruit elliptic.
Corchorus parviflorus	0.1	80	MBU06-05	
Dampiera candicans	0.1	50	MBU06-30	Resprouting
Eriachne mucronata (typical form)	0.1	50	MBU06-29	
Eucalyptus leucophloia subsp. *leucophloia*	0.1	280		Regrowth.
Euphorbia australis var. *subtomentosa*	0.1	2	MBU06-24	Prostrate; slightly grey green.
Euphorbia boophthona	0.1	10	MBU06-16	
Fimbristylis dichotoma	0.1	15	MBU06-02	PLDK: sens. lat.; style ciliate in upper portion.
Fimbristylis simulans	0.1	15	MBU06-11	
Goodenia microptera	0.1	20	MBU06-27	
Gossypium australe	0.1	45		Burrup Peninsula form: greener indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	80	MBU06-32	Sterile; subsp. applied from flowering collections.
Haloragis gossei var. *gossei*	0.1	4	MBU06-13	Variety assigned based on other fruiting specimens.
Heliotropium pachyphyllum	0.1	25	MBU06-12, 25	
Hibiscus sturtii var. *campylochlamys*	0.1	60	MBU06-04	Flowers mauve.
Indigofera monophylla	0.1	40	MBU06-06	PLDK: sens. lat.
Oldenlandia crouchiana	0.1	20	MBU06-23	PLDK: sens. lat.
Pluchea tetranthera	0.1	70	MBU06-34	
Polycarpaea corymbosa var. *corymbosa*	0.1	10	MBU06-26	
Polycarpaea holtzei	0.1	3	MBU06-22	
Polygala glaucifolia	0.1	5	MBU06-08	
Polymeria ambigua	0.1	20	MBU06-09	
Ptilotus auriculifolius	0.1	5	MBU06-10	
Ptilotus calostachyus	0.1	100	MBU06-19	
Senna glutinosa subsp. *glutinosa*	0.1	70	MBU06-31	MET det.
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	60	MBU06-17	Ferruginous form.
Sporobolus australasicus	0.1	5		
Tribulus hirsutus	0.1	5	MBU06-28	
Trigastrotheca molluginea	0.1	12		White flowers.
Triodia epactia	20	40	MBU06-07	
Yakirra australiensis var. *australiensis*	0.1	6	MBU06-20	



Marble Bar Rd Upgrade **Site** MBU07

Described by RW,RM **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 196123 mE, 7601499 mN 120.063864°E, -21.663814°S

Habitat Footslope of medium hills; gently undulating.

Soil Reddish brown (5YR 4/3) loamy sand.

Rock Type Hardey Formation; sandstone.

Vegetation *Acacia ptychophylla* scattered low shrubs over *Triodia epactia* hummock grassland.

Veg Condition Excellent: minor signs of past disturbance, grader activity.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	30	MBU07-08	PLDK: sens. lat.
Acacia orthocarpa (wispy form)	0.1	180	MBU07-23	
Acacia ptychophylla	1	40	MBU07-03	
Acacia pyrifolia var. *pyrifolia*	0.1	110	MBU07-05	
Aristida contorta	0.1	20	MBU07-17	
Bonamia pilbarensis	0.1	10	MBU07-04	
Corchorus parviflorus	0.1	35	MBU07-12	
Dampiera candicans	0.1	60	MBU07-10	
Enneapogon caerulescens	0.1	20	MBU07-25	
Eriachne pulchella	0.1	5		
Fimbristylis dichotoma	0.1	10	MBU07-20	PLDK: sens. lat.; styles wholly ciliate.
Fimbristylis simulans	0.5	10	MBU07-06	
Gossypium australe	0.1	40		Juvenile.
Grevillea wickhamii subsp. *hispidula*	0.1	60	MBU07-24	Sterile; subsp. applied from flowering collections.
Hakea lorea subsp. *lorea*	0.1	50	MBU07-26	Juvenile. PLDK: sens. lat.
Hibiscus coatesii	0.1	30	MBU07-16	
Paraneurachne muelleri	0.1	30	MBU07-11	
Polycarpaea holtzei	0.1	2	MBU07-09	
Portulaca cyclophylla	0.1	5	MBU07-21	
Portulaca oleracea/intraterranea	0.1	3	MBU07-19	PLDK: seeds faintly nippled.
Ptilotus calostachyus	0.1	30	MBU07-13	
Ptilotus exaltatus	0.1	15		
Senna glutinosa subsp. *glutinosa*	0.1	70	MBU07-27	
Senna symonii	0.1	50	MBU07-22	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	40	MBU07-15	Ferruginous form.
Sporobolus australasicus	0.1	10	MBU07-18	
Trigastrotheca molluginea	0.1	20	MBU07-14	
Triodia brizoides	1	40	MBU07-01	
Triodia epactia	45	40	MBU07-02	PLDK: sens. lat.
Tripogonella loliiformis	0.1	10	MBU07-07	



Marble Bar Rd Upgrade **Site** MBU08

Described by RW,RM **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 196009 mE, 7604253 mN 120.063267°E, -21.638945°S

Habitat Low hill; plateau section, bordered by low hills; not a crest or slope.

Soil Yellowish red (5YR 5/6) loamy sand.

Rock Type Hardey Formation; sandstone.

Vegetation *Acacia orthocarpa,* (*Indigofera monophylla*) low open shrubland over *Triodia epactia* hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	40		
Acacia orthocarpa	7	50	MBU08-01	PLDK: Bushy form.
Acacia trachycarpa	0.1	40	MBU08-07	
Aristida holathera var. *holathera*	0.1	30	MBU08-08	
Bonamia pilbarensis	0.1	20	MBU07-04=	
Corchorus parviflorus	0.1	30	MBU07-12=	
Eriachne pulchella	0.1	5		
Gossypium australe	0.1	30	MBU08-06	Burrup Peninsula form: greener indumentum.
Hakea lorea subsp. *lorea*	0.1	210	MBU08-04	PLDK: sens. lat.
Heliotropium skeleton	0.1	30	MBU08-03	
Indigofera monophylla	1	60	MBU08-02	PLDK: sens. lat.
Indigofera monophylla	0.1	80	MBU08-11	PLDK: sens. lat.
Senna artemisioides subsp. *oligophylla*	0.1	60	MBU08-10	
Senna glutinosa subsp. *glutinosa*	0.1	15		
Senna symonii	0.1	80	MBU07-22=	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	30	MBU07-15=	Ferruginous form.
Sida aff. sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	40	MBU08-09	Equivalent to MET taxon "*Sida* aff. *pilbarensis* (EOB46-01B)".
Trigastrotheca molluginea	0.1	20	MBU07-14=	
Triodia epactia	45	40	MBU07-02=	PLDK: sens. lat.
Tripogonella loliiformis	0.1	60	MBU07-07=	



Marble Bar Rd Upgrade **Site** MBU09

Described by RW,RM **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 195972 mE, 7605823 mN 120.063196°E, -21.624773°S

Habitat Hill slope.

Soil Dusky red (10R 3/3) light sandy clay loam.

Rock Type Volcanic; basalt.

Vegetation *Acacia inaequilatera* tall open shrubland over *Sida echinocarpa* scattered low shrubs over *Triodia wiseana, T. epactia* hummock grassland.

Veg Condition Excellent: minor old ground disturbance (channel).

Fire Age Burnt 3-5 years ago.

Notes Constructed channel has lots of spp.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	80		
Acacia inaequilatera	3	220	MBU09-04	
Arivela viscosa	0.1	10	MBU09-05	
Bonamia pilbarensis	0.1	3	MBU07-04=	
Corchorus parviflorus	0.1	60	MBU09-03	
Enneapogon caerulescens	0.1	10	MBU09-10	
Fimbristylis simulans	0.1	10	MBU09-08	
Goodenia microptera	0.1	20		
Goodenia muelleriana	0.1	20	MBU09-07	Sens. lat.
Goodenia stobbsiana	0.1	30		
Grevillea wickhamii subsp. *hispidula*	0.1	170		Sterile; subsp. applied from flowering collections.
Hakea chordophylla	0.1	40		
Heliotropium pachyphyllum	0.1	20	MBU09-06	
Indigofera monophylla	0.1	60	MBU08-02=	PLDK: sens. lat.
Portulaca oleracea/intraterranea	0.1	5	MBU07-19=	PLDK: seeds faintly nippled.
Ptilotus calostachyus	0.1	70		
Ptilotus exaltatus	0.1	10		
Senna notabilis	0.1	10		
Sida aff. sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	25	MBU09-09	Equivalent to MET taxon "*Sida* aff. *pilbarensis* (EOB46-01B)".
Sida echinocarpa	1	60	MBU09-02	
Trigastrotheca molluginea	0.1	4		
Triodia epactia	25	40	MBU07-02=	PLDK: sens. lat.
Triodia wiseana	25	40	MBU09-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU10

Described by RW,RM **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 197557 mE, 7598107 mN 120.077088°E, -21.694665°S

Habitat Plain adjacent to medium hills.

Soil Reddish brown (5YR 4/3) sandy loam.

Rock Type Colluvium.

Vegetation *Acacia trachycarpa,* (*A. bivenosa*) open shrubland over *Triodia epactia,* (*T. longiceps*) hummock grassland.

Veg Condition Excellent: single **Cenchrus* plant.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	30	MBU10-27	
Acacia bivenosa	2	120		
Acacia eriopoda x *trachycarpa*	0.1	250	MBU10-40	
Acacia pyrifolia var. *pyrifolia*	0.1	170	MBU10-23	
Acacia synchronicia	0.1	140	MBU10-20	PLDK: sens. lat.
Acacia trachycarpa	6	140	MBU10-01	
Aristida contorta	0.1	30		
Aristida holathera var. *holathera*	0.1	45	MBU10-24, -47	
Arivela viscosa	0.1	30		
Bonamia pannosa	0.1	25	MBU10-28	
Bonamia pilbarensis	0.1	20	MBU07-04=	
Bulbostylis barbata	0.1	5	MBU10-33	
**Cenchrus ciliaris*	0.1	30	NI=1	
Corchorus parviflorus	0.1	25	MBU10-08A	
Cucumis variabilis	0.1	30	MBU10-45	
Cullen pogonocarpum	0.1	10	MBU10-35	
Cymbopogon obtectus	0.1	110	MBU10-34	
Dactyloctenium radulans	0.1	5		
Dysphania sp.	0.1	3	MBU10-42	Juvenile, sterile; inadequate material for det.
Ehretia saligna var. *saligna*	0.1	120	MBU10-09	
Eragrostis cumingii	0.1	15		
Eragrostis eriopoda	0.1	30	MBU10-06	
Euphorbia boophthona	0.1	45	MBU10-15	
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Fimbristylis dichotoma	0.1	30	MBU10-04	PLDK: sens. lat.; styles wholly ciliate.
Goodenia microptera	0.1	30	MBU10-22	
Gossypium australe	0.1	40	MBU10-44	Burrup Peninsula form: greener indumentum.
Hakea lorea subsp. *lorea*	0.1	230	MBU10-21	PLDK: sens. lat.
Heliotropium cunninghamii	0.1	20	MBU10-18	
Hibiscus sturtii var. *campylochlamys*	0.1	40	MBU10-26, -32	
Indigofera linnaei	0.1	20	MBU10-12	
Indigofera monophylla	0.1	80	MBU10-10	PLDK: sens. lat.
Perotis rara	0.1	10	REL05-16=	
Phyllanthus erwinii	0.1	4	MBU10-29	
Pluchea dentex	0.1	30	REL05-03=	
Pluchea ferdinandi-muelleri	0.1	30	MBU10-25	
Pluchea tetranthera	0.1	40	MBU10-16	
Polycarpaea corymbosa var. *corymbosa*	0.1	5	MBU10-11	
Portulaca oleracea/intraterranea	0.1	5	MBU07-19=	PLDK: seeds faintly nippled.
Pterocaulon sphacelatum	0.1	5	MBU10-30	
Ptilotus astrolasius	0.1	30	MBU10-03	
Rhynchosia minima	0.1	5		
Salsola australis	0.1	5	Juvenile.	
Sclerolaena costata	0.1	20	MBU10-38, -43	
Senna artemisioides subsp. *helmsii*	0.1	80	MBU10-13	
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.1	90	MBU10-05	

Species	Cover	Height	Specimen	Notes
Senna glutinosa subsp. *x luerssenii*	0.1	60	MBU10-17	
Sida clementii	0.1	60	MBU10-39	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	60	MBU10-31	Ferruginous form.
Solanum diversiflorum	0.1	5		
Sporobolus australasicus	0.1	15	MBU10-07	
Stemodia grossa	0.1	30		
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	30	MBU10-19	
Trianthema triquetrum	0.1	5	MBU10-37	
Tribulus hirsutus	0.1	10	MBU10-41	
Trigastrotheca molluginea	0.1	20		
Triodia epactia	30	40	MBU10-02	PLDK: sens. lat.
Triodia longiceps	11	60		
Yakirra australiensis var. *australiensis*	0.1	5	MBU10-14	



Marble Bar Rd Upgrade **Site** MBU11

Described by RW,RM **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 198413 mE, 7595748 mN 120.084924°E, -21.716096°S

Habitat Crest and slopes of low hill.

Soil Dark reddish brown (5YR 3/3) light sandy clay loam.

Rock Type Hardey Formation; sandstone.

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia orthocarpa* (wispy form) tall open shrubland over *Triodia epactia* open hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	90		
Acacia orthocarpa (wispy form)	3	500	MBU11-01	
Acacia pyrifolia var. *pyrifolia*	0.1	220		
Arivela viscosa	0.1	4		
Bonamia pilbarensis	0.1	20	MBU34-06=	
Bulbostylis barbata	0.1	4		
Corchorus lasiocarpus	0.1	40		
Eriachne pulchella	0.1	5		
Eucalyptus leucophloia subsp. *leucophloia*	0.5	250	MBU11-04	
Fimbristylis dichotoma	0.1	15	MBU11-06	PLDK: sens. lat.; styles wholly ciliate.
Gossypium australe	0.1	110		Burrup Peninsula form: greener indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	140		Sterile; subsp. applied from flowering collections.
Polycarpaea corymbosa var. *corymbosa*	0.1	10	MBU11-03	
Ptilotus auriculifolius	0.1	10	MBU11-07	
Senna artemisioides subsp. *oligophylla*	0.1	70	MBU11-02	
Senna glutinosa subsp. *glutinosa*	0.1	130	MBU11-05	
Senna glutinosa subsp. *pruinosa*	0.1	50	MBU11-09	
Sporobolus australasicus	0.1	4		
Tribulus hirsutus	0.1	5	MBU11-08	
Triodia epactia	30	40	MBU10-02=	PLDK: sens. lat.
Tripogonella loliiformis	0.1	15	MBU11-10	



Marble Bar Rd Upgrade **Site** MBU12

Described by SC **Date** 05-Mar-20 **Type** Quadrat 40 x 60 m

MGA Zone 51 195864 mE, 7604816 mN 120.061970°E, -21.633841°S

Habitat Gently sloping plain, western aspect; hills 100 m E of quadrat.

Soil Reddish brown sandy loam.

Rock Type Hardey Formation; sandstone (scattered pebbles).

Vegetation *Acacia trachycarpa,* (*A. bivenosa*) scattered shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Some small sandy drainage lines through quadrat. *Acacia trachycarpa* only in small section coming down from hilly area.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	110		
Acacia trachycarpa	1	110	MBU12-01	
Arivela viscosa	0.1	10		Tiny. Sterile.
Bulbostylis barbata	0.1	5		
Cassytha capillaris	0.1	30		
Chrysopogon fallax	0.1	80	MBU12-06	
Corchorus parviflorus	0.1	70	MBU12-03	
Cymbopogon obtectus	0.1	40	MBU12-21	
Eragrostis cumingii	0.1	5	MBU12-10	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU12-07	
Fimbristylis dichotoma	0.1	20	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Goodenia lamprosperma	0.1	30	MBU12-18	
Goodenia microptera	0.1	20		
Heliotropium pachyphyllum	0.1	20	MBU12-17	
Hibiscus sturtii var. *campylochlamys*	0.1	30	MBU12-04, -19	
Hybanthus aurantiacus	0.1	20	MBU12-16	PLDK: sens. lat.
Indigofera monophylla	0.1	40	MBU12-08	PLDK: sens. lat.; type 3 (small leaf 15 x 10 mm, small inconspicuous stipule; hairs partly appressed, partly dendritic upright).
Isotropis atropurpurea	0.1	10	MBU12-13	
Paraneurachne muelleri	0.1	20		
Paspalidium rarum	0.1	15	MBU12-22	
Pluchea dentex	0.1	30	MBU12-05	
Pluchea tetranthera	0.1	10	MBU12-15	
Polymeria ambigua	0.1	5	MBU12-23	
Ptilotus fusiformis	0.1	15	MBU12-20	
Sclerolaena densiflora	0.1	20	MBU12-14	PLDK: sens. lat.
Senna notabilis	0.1	3		
Sporobolus actinocladus	0.1	15	MBU12-11	
Stemodia grossa	0.1	50		
Trianthema cusackianum	0.1	15	MBU12-12	
Triodia epactia	3	40	MBU12-09	PLDK: sens. lat.
Triodia longiceps	35	50	MBU12-02	



Marble Bar Rd Upgrade **Site** MBU13

Described by SC **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 196224 mE, 7606450 mN 120.065742°E, -21.619158°S

Habitat Low rocky hill.

Soil Reddish brown clay loam.

Rock Type Volcanic; basalt.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* hummock grassland.

Veg Condition Excellent: 1 *Cenchrus plant.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	70	MBU13-20	PLDK: sens. lat.
Acacia coriacea subsp. *pendens*	0.1	40	MBU13-18	
Acacia inaequilatera	1	300	MBU13-02	
Arivela viscosa	0.1	5	Small; sterile.	
Boerhavia gardneri	0.1	20	MBU13-09	
Bonamia pilbarensis	0.1	15	MBU13-11	
*Cenchrus ciliaris	0.1	30		NI=1.
Corchorus parviflorus	1	60	MBU13-12	
Corymbia hamersleyana	0.1	400		
Cucumis variabilis	0.1	30		
Enneapogon lindleyanus	0.1	30	MBU13-04	
Euphorbia careyi	0.1	20	MBU13-08	
Evolvulus alsinoides var. *villosicalyx*	0.1	20	MBU13-05	
Goodenia muelleriana	0.1	20	MBU13-21	Sens. lat.
Grevillea pyramidalis subsp. *leucadendron*	0.1	120		
Hybanthus aurantiacus	0.1	10	MBU12-16=	
Indigofera monophylla	0.1	60	MBU13-15	PLDK: sens. lat.
Indigofera rugosa	0.1	50	MBU13-16	
Notoleptopus decaisnei	0.1	5	MBU13-22	
Oldenlandia crouchiana	0.1	5	MBU13-07	PLDK: sens. lat.
Rhynchosia minima	0.1	40		
Senna glutinosa subsp. *glutinosa*	0.1	80	MBU13-13	
Sida echinocarpa	0.1	40	MBU13-06, -14	
Tephrosia densa	0.1	60	MBU13-17	
Triodia epactia	31	40	MBU13-03, -23	PLDK: sens. lat.
Triodia wiseana	0.5	40	MBU13-01	PLDK: sens. lat.; long lemma lobe form.
Triumfetta clementii	0.1	40		
Triumfetta maconochieana	0.1	60	MBU13-19	



Marble Bar Rd Upgrade **Site** MBU14

Described by SC **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 196330 mE, 7607806 mN 120.067012°E, -21.606941°S

Habitat Foothills of ridge to east; relatively flat, minor eastern aspect.

Soil Reddish brown sandy loam.

Rock Type Colluvium; volcanics, quartz.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* open hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Notes More *Corymbia hamersleyana* in broader unit.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	1	250		
Acacia pyrifolia var. *pyrifolia*	0.1	250		
Bulbostylis barbata	0.1	5		
**Cenchrus setiger*	0.1	20		NI=3
Corchorus parviflorus	0.1	50	MBU14-08	
Corymbia hamersleyana	0.1	50		
Enneapogon caerulescens	0.1	5	MBU14-09	
Eremophila forrestii subsp. *forrestii*	0.1	50	MBU14-01	
Eriachne pulchella	0.1	5	MBU02-20=	Sens lat.
Euphorbia vaccaria var. *vaccaria*	0.1	5	MBU14-04	
Fimbristylis dichotoma	0.1	10	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Gossypium australe	0.1	50	MBU14-11	Burrup Peninsula form: greener indumentum.
Hakea lorea subsp. *lorea*	0.1	60	MBU14-07	PLDK: sens. lat.
Heliotropium sp.	0.1	5	MBU14-10	Inadequate material; sterile.
Notoleptopus decaisnei	0.1	5	MBU13-22=	
Senna artemisioides subsp. *helmsii*	0.1	50	MBU14-02	
Senna glutinosa subsp. *glutinosa*	0.1	30	MBU13-13=	
Senna glutinosa subsp. *pruinosa*	0.1	20	MBU14-06	
Sida echinocarpa	0.1	30	MBU13-14=	
Solanum phlomoides	0.1	10	MBU14-12	
Sporobolus australasicus	0.1	5		
Triodia wiseana	29	40	MBU14-05	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU15

Described by SC **Date** 05-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 196285 mE, 7608584 mN 120.066719°E, -21.599914°S

Habitat Slope of foothill.

Soil Reddish brown sandy loam.

Rock Type Basalt.

Vegetation *Acacia synchronicia* tall open shrubland over *Triodia epactia* open hummock grassland with *Fimbristylis dichotoma* scattered sedges.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	180		
Acacia synchronicia	5	300	MBU15-06	PLDK: sens. lat.
Alysicarpus muelleri	0.1	5	MBU15-01	
Aristida contorta	0.1	10	MBU02-14=	
Arivela viscosa	0.1	5		Sterile.
Boerhavia gardneri	0.1	5	MBU13-09=	
Bulbostylis barbata	0.1	5		
Carissa lanceolata	0.1	150	MBU15-09	
Corchorus incanus subsp. *incanus*	0.1	40	MBU15-15	
Dactyloctenium radulans	0.1	5		
Dichanthium sericeum subsp. *humilius*	0.1	5	MBU15-17	NI=10.
Digitaria ctenantha	0.1	20	MBU15-13	
Eremophila forrestii subsp. *forrestii*	0.1	100	MBU14-01=	
Eriachne pulchella	0.1	5	MBU02-20=	Sens lat.
Euphorbia biconvexa	0.1	10	MBU15-10	
Evolvulus alsinoides var. *villosicalyx*	0.1	15	MBU13-05=	
Fimbristylis dichotoma	1	15	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Heliotropium cunninghamii	0.1	5	MBU15-14	
Hibiscus sturtii var. *campylochlamys*	0.1	20	MBU15-18	
Hibiscus sturtii var. *platychlamys*	0.1	40	MBU15-12	
Iseilema dolichotrichum	0.1	3	MBU15-11	
Paspalidium rarum	0.1	10	MBU12-22=	
Phyllanthus erwinii	0.1	5	MBU15-16	
Portulaca oleracea/intraterranea	0.1	5	MBU15-02	PLDK: seeds distinctly nippled.
Senna artemisioides subsp. *helmsii*	0.1	50	MBU14-02=	
Senna glutinosa subsp. *x luerssenii*	0.1	120	MBU15-03	MET det.
Sida echinocarpa	0.1	6	MBU13-06=	
Sporobolus australasicus	0.1	5		
Stemodia grossa	0.1	5		
Swainsona stenodonta	0.1	10	MBU15-19	
Triodia epactia	30	40	MBU15-04	PLDK: sens. lat.
Triodia longiceps	0.1	60	MBU15-05A	
Triodia wiseana	0.1	30	MBU15-07	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU16

Described by SC **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 198265 mE, 7596858 mN 120.083697°E, -21.706055°S

Habitat Dissected foothills with drainage line around quadrat; hills to west.

Soil Reddish brown sandy clay loam.

Rock Type Hardey Formation; sandstone, quartz.

Vegetation *Acacia orthocarpa* (wispy form), (*A. eriopoda*) tall shrubland over *Triodia epactia* open hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago/No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	101		
Acacia eriopoda	2	400	MBU16-02	PLDK: leaves longer; marginal veins.
Acacia orthocarpa (wispy form)	13	400	MBU16-01	
Aristida contorta	0.1	30		
Arivela viscosa	0.1	5		Sterile.
Bonamia erecta	0.1	20	MBU16-04	
Bonamia pannosa	0.1	5		
Bulbostylis barbata	0.1	5		
Corchorus parviflorus	0.1	40	MBU16-05	
Eragrostis cumingii	0.1	10	REL07-40=	
Eriachne pulchella	0.1	5		
Evolvulus alsinoides var. *villosicalyx*	0.1	5	Sterile.	
Fimbristylis dichotoma	0.1	20	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Goodenia microptera	0.1	5		Tiny. Sterile.
Gossypium australe	0.1	10		Burrup Peninsula form: greener indumentum.
Heliotropium cunninghamii	0.1	5	MBU16-11	White flowers.
Indigofera monophylla	0.1	40	MBU12-08=	PLDK: sens. lat.; type 3 (small leaf 15 x 10 mm, small inconspicuous stipule; hairs partly appressed, partly dendritic upright).
Isotropis atropurpurea	0.1	20	MBU12-13=	
Pluchea dentex	0.1	30	MBU16-09	
Pluchea ferdinandi-muelleri	0.1	15		
Polycarpaea corymbosa var. *corymbosa*	0.1	10	MBU16-10	
Polygala glaucifolia	0.1	5	MBU16-07	
Polymeria sp.	0.1	5	MBU16-08	Inadequate material; sterile
Senna glutinosa subsp. *glutinosa*	0.1	200		
Sporobolus australasicus	0.1	5		
Triodia epactia	21	30	MBU16-03	PLDK: sens. lat.
Yakirra australiensis var. *australiensis*	0.1	5	MBU16-06	



Marble Bar Rd Upgrade **Site** MBU17
Described by RW,RM **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 198479 mE, 7592724 mN 120.085011°E, -21.743393°S
Habitat Slope of minor range of hills; E-facing slope.
Soil Dark brown (7.5YR 3/2) sandy clay loam.
Rock Type Hardey Formation; rhyodacite.
Vegetation *Acacia monticola* open shrubland over *Triodia epactia,* (*T. brizoides*) hummock grassland.
Veg Condition Excellent.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	1	210	MBU17-15	
Acacia monticola	5	120		
Amaranthus undulatus	0.1	5	MBU17-05	
Arivela viscosa	0.1	30		
Cajanus cinereus	1	100	MBU17-12	
Corchorus parviflorus	0.1	25	MBU17-02, 17	
Cucumis variabilis	0.1	90		
Cymbopogon ambiguus	1	45	MBU17-07	
Cyperus hesperius	0.1	45	MBU17-09	
Ehretia saligna var. *saligna*	0.1	150	MBU17-11	
Enneapogon lindleyanus	0.1	30	MBU17-08	
Eriachne tenuiculmis	0.1	40	MBU17-10	
Euphorbia trigonosperma	0.1	15	MBU17-04	
Gossypium australe	1	80	MBU17-14	Whim Creek form: greyer indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	170		
Grevillea wickhamii subsp. *hispidula*	0.1	220	.	Sterile; subsp. applied from flowering collections
Indigofera monophylla	0.1	30	MBU17-06	PLDK: sens. lat.; type 3 (small leaf 15 x 10 mm, small inconspicuous stipule; hairs partly appressed, partly dendritic upright).
Melhania oblongifolia	0.1	50	MBU17-16	PLDK: sens. lat.
Rhynchosia minima	0.1	35		
Senna glutinosa subsp. *glutinosa*	0.1	80	MBU17-13	
Solanum cleistogamum	0.1	20		
Solanum diversiflorum	0.1	20		
Tinospora smilacina	0.1	20	MBU17-03	
Tribulus suberosus	0.1	50		
Trichodesma zeylanicum var. *zeylanicum*	0.1	2		
Triodia brizoides	5	25	MBU17-01	
Triodia epactia	35	30		



Marble Bar Rd Upgrade **Site** MBU18

Described by RW,RM **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 199581 mE, 7588565 mN 120.094898°E, -21.781107°S

Habitat Creek channels and adjacent floodplain/bank.

Soil Dark brown (7.5YR 3/2) loamy sand.

Rock Type Chert, mudstone.

Vegetation *Eucalyptus victrix* low open woodland over *Acacia trachycarpa, A. coriacea* subsp. *pendens* open shrubland over *Eriachne benthamii* open tussock grassland with *Triodia longiceps* very open hummock grassland and *Marsilea hirsuta* open fernland.

Veg Condition Very Good: **Malvastrum* present and signs of cattle.

Fire Age No sign of recent fire.

Notes Soil has some patches with visibly more clay.

Species	Cover	Height	Specimen	Notes
Acacia colei	0.1	50	MBU18-16	PLDK: sterile; var. not det.
Acacia coriacea subsp. *pendens*	1	160	REL04-22=	
Acacia synchronicia	0.1	40		
Acacia trachycarpa	2	160	MBU10-01=	
Alternanthera denticulata	0.1	10	MBU18-10	
Amaranthus undulatus	0.1	5	MBU18-23B	
Arivela viscosa	0.1	10		
Bergia pedicellaris	0.1	15	MBU18-15	
Boerhavia burbidgeana	0.1	20	MBU18-12	
Boerhavia coccinea	0.1	30	MBU18-30	Sens lat.
Bulbostylis barbata	0.1	10	MBU18-28	
Bulbostylis turbinata	0.1	10	MBU18-07	
Chrysopogon fallax	0.1	70	REL04-11=	
Corchorus parviflorus	0.1	60	MBU10-08A=	
Corchorus tridens	0.1	10	MBU18-24	
Crotalaria medicaginea var. *neglecta*	0.1	20		
Cucumis variabilis	0.1	60		
Cyperus bifax	0.1	60	MBU18-13	
Cyperus iria	0.1	20	MBU18-21	
Cyperus vaginatus	0.1	60		
Dactyloctenium radulans	0.1	5		
**Echinochloa colona*	0.1	60	MBU18-19	
Eragrostis cumingii	0.1	10		
Eragrostis leptocarpa	0.1	30	MBU18-22B	
Eragrostis tenellula	0.1	20	MBU18-22	
Eriachne benthamii	15	60	MBU18-26	
Eriachne flaccida	0.1	25	MBU18-02	PLDK: diminutive glumes/florets. M Hislop (WAH) determined as E. *flaccida*.
Eucalyptus victrix	9	650		
Eulalia aurea	0.1	70		
Euphorbia trigonosperma	0.1	10	MBU18-23A	
Evolvulus alsinoides var. *decumbens*	0.1	20		
Gomphrena canescens subsp. *canescens*	0.1	10		
Goodenia lamprosperma	0.1	25	MBU18-08	
Heliotropium cunninghamii	0.1	30	MBU18-27	
Hibiscus sturtii var. *campylochlamys*	0.1	10	MBU18-06	
Hybanthus aurantiacus	0.1	10		
Indigofera monophylla	0.1	20	MBU18-20	NI=4.
Ipomoea coptica	0.1	60	MBU18-01	
Ipomoea muelleri	0.1	40		
**Malvastrum americanum*	0.1	30		NI=10
Marsilea hirsuta	15	5	REL04-02=	
Panicum decompositum	0.1	50	MBU18-05	
Paspalidium rarum	0.1	10	MBU18-09	
Phyllanthus exilis	0.1	25	MBU18-18	
Phyllanthus maderaspatensis	0.1	5		
Pluchea dentex	0.1	20	MBU18-04	

Species	Cover	Height	Specimen	Notes
Pluchea rubelliflora	0.1	30		
Polymeria ambigua	0.1	30	MBU18-29	
Portulaca oleracea/intraterranea	0.1	5		
Schoenoplectiella laevis	0.1	10	MBU18-31	
Sesbania cannabina	0.1	20		
Sida fibulifera	0.1	20	MBU18-14	PLDK: sens. lat.
Solanum diversiflorum	0.1	35		
Sporobolus australasicus	0.1	10		
Stemodia grossa	0.1	40		
Stemodia viscosa	0.1	30	MBU18-17	
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	0.1	70		
Triodia longiceps	7	60		
Triumfetta chaetocarpa	0.1	70	MBU18-03	
Vigna lanceolata var. *lanceolata*	0.1	35	MBU18-25	
Waltheria indica	0.1	40	MBU18-11	



Marble Bar Rd Upgrade **Site** MBU19

Described by RW,RM **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201152 mE, 7585366 mN 120.109496°E, -21.810239°S

Habitat Plain adjacent to low to medium hills

Soil Reddish brown (5YR 4/4) sandy loam.

Rock Type Hardey Formation; siltstone/mudstone.

Vegetation *Indigofera monophylla* scattered shrubs over *Acacia trachycarpa* scattered low shrubs over *Triodia epactia* open hummock grassland.

Veg Condition Very Good: signs of cattle.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	5		
Acacia trachycarpa	0.5	70	MBU10-01=	
Aristida contorta	0.1	20		
Bonamia erecta	0.1	30	MBU19-09	
Corchorus parviflorus	0.1	50	MBU10-08A=	
Enneapogon caerulescens	0.1	30	MBU19-02	
Eriachne pulchella	0.1	2		
Fimbristylis dichotoma	0.1	15	MBU19-05	PLDK: sens. lat.; styles wholly ciliate.
Goodenia microptera	0.1	25		
Gossypium australe	0.1	30		Burrup Peninsula form: greener indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	170		Sterile; subsp. applied from flowering collections.
Heliotropium pachyphyllum	0.1	25	MBU19-10	
Hibiscus sturtii var. *campylochlamys*	0.1	15	MBU19-04	
Indigofera monophylla	1	130		NI=25
Pluchea dentex	0.1	20		
Pluchea ferdinandi-muelleri	0.1	40	MBU19-08	
Pluchea tetranthera	0.1	30	MBU10-16=	
Polycarpaea holtzei	0.1	5		
Portulaca oleracea/intraterranea	0.1	2		
Ptilotus calostachyus	0.1	10		
Ptilotus clementii	0.1	5		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	140	MBU19-13	MET det.
Senna notabilis	0.1	3		
Sida echinocarpa	0.1	20	MBU19-12	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	35	MBU19-03	Ferruginous form.
Sporobolus australasicus	0.1	20		
Tribulus hirsutus	0.1	2	MBU19-06	
Trigastrotheca molluginea	0.1	15		
Triodia epactia	25	40	MBU19-01	PLDK: sens. lat.
Yakirra australiensis var. *australiensis*	0.1	5	MBU19-07	



Marble Bar Rd Upgrade **Site** MBU20
Described by AL,MET **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 196569 mE, 7599721 mN 120.067844°E, -21.679933°S
Habitat Crest and upper slopes of a low hill.
Soil Reddish brown silty clay loam.
Rock Type Hardey Formation; sandstone.
Vegetation *Triodia epactia* hummock grassland.
Veg Condition Excellent to Very Good.
Fire Age Burnt 1-2 years ago.
Notes Triodia percentage from unburnt areas (where soft spinifex occurs, there is 40% cover).

Species	Cover	Height	Specimen	Notes
Acacia adoxa var. *adoxa*	0.1	40	MBU20-03	
Acacia bivenosa	0.1	20		
Acacia ptychophylla	0.1	40	MBU20-02	
Acacia pyrifolia var. *pyrifolia*	0.1	100	MBU20-24	Stems thickly pruinose.
Aristida contorta	0.1	15		
Aristida holathera var. *holathera*	0.1	20	MBU20-10	
Bonamia erecta	0.1	20	MBU20-19	
Bonamia pannosa	0.1	15	MBU20-06	
Bonamia pilbarensis	0.1	5	MBU20-39	
Bulbostylis barbata	0.1	5	MBU20-38	
Chrysopogon fallax	0.1	50	MBU20-35	Small tussock.
Corchorus parviflorus	0.1	25	MBU20-31	
Dampiera candicans	0.1	7		
Dodonaea coriacea	0.1	15	MBU20-21	
Eriachne lanata	0.1	50	MBU20-40	
Eriachne mucronata (typical form)	0.1	25	MBU20-28	
Eriachne pulchella	0.1	15	MBU20-37	Sens lat.
Fimbristylis dichotoma	0.1	70	MBU20-23	PLDK: sens. lat.; styles wholly ciliate.
Fimbristylis simulans	0.1	10	MBU20-15	
Goodenia microptera	0.1	35	MBU20-33	
Goodenia stobbsiana	0.1	35		
Hakea lorea subsp. *lorea*	0.1	220	MBU20-07	PLDK: sens. lat.
Heliotropium pachyphyllum	0.1	20	MBU20-13, -18	
Heliotropium skeleton	0.1	40	MBU20-25	
Hibiscus burtonii	0.1	50	MBU20-26	
Hybanthus aurantiacus	0.1	20	MBU20-04	PLDK: sens. lat.
Isotropis atropurpurea	0.1	30	MBU20-27	
Paraneurachne muelleri	0.1	12	MBU20-11	Juvenile.
Polycarpaea holtzei	0.1	1	MBU20-36	
Ptilotus calostachyus	0.1	90		
Ptilotus exaltatus	0.1	15		
Ptilotus fusiformis	0.1	35	MBU20-34	
Scaevola browniana subsp. *browniana*	0.1	35	MBU20-01	PLDK: indusium glabrous, bracteoles atypical; matches SC06.
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	30	MBU20-09	MET det.
Senna notabilis	0.1	15		
Senna symonii	0.1	90		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	15	MBU20-12	Ferruginous form.
Solanum diversiflorum	0.1	20		
Solanum horridum	0.1	15	MBU20-16	
Solanum phlomoides	0.1	15	MBU20-30	
Streptoglossa bubakii	0.1	10	MBU20-20	
Streptoglossa decurrens	0.1	10	MBU20-29	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	5	MBU20-14	Prostrate perennial herb.
Tribulus hirsutus	0.1	15	MBU20-08	Spreading.
Tribulus platypterus	0.1	50	MBU20-17	
Trigastrotheca molluginea	0.1	15		

Species	Cover	Height	Specimen	Notes
Triodia basedowii	0.1	40	MBU20-22	Det by M Hislop (WAH).
Triodia epactia	40	50	MBU20-05	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU21

Described by AL,MET **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 197091 mE, 7598833 mN 120.072722°E, -21.688035°S

Habitat Plain.

Soil Dark red (2.5YR 3/6) silty clay.

Rock Type N/A.

Vegetation *Acacia bivenosa* tall open shrubland over *Triodia wiseana* hummock grassland.

Veg Condition Excellent to Very Good: some **Cenchrus*; cattle scats and tracks.

Fire Age No sign of recent fire.

Notes One isolated patch of *Triodia longiceps*, which is excluded from veg description; unrepresentative of broader area.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	15	MBU21-15	
Acacia bivenosa	8	260	MBU21-04	PLDK: sens. lat.
Acacia inaequilatera	0.1	400	MBU21-12	
**Cenchrus ciliaris*	0.1	40		
Corchorus parviflorus	0.1	60	MBU21-08	
Corymbia hamersleyana	0.1	400	MBU21-05	Sens lat.
Enneapogon caerulescens	0.1	30	MBU21-07	
Euphorbia trigonosperma	0.1	15	MBU21-03	
Evolvulus alsinoides var. *villosicalyx*	0.1	20	MBU21-06	
Goodenia forrestii	0.1	15		
Goodenia microptera	0.1	30		
Hakea lorea subsp. *lorea*	0.1	50		
Haloragis gossei var. *gossei*	0.1	4		Sterile; variety assigned based on other fruiting specimens.
Heliotropium chrysocarpum	0.1	15	MBU21-13	
Heliotropium cunninghamii	0.1	6	MBU21-11	
Hibiscus sturtii var. *campylochlamys*	0.1	40	MBU21-10	
Paraneurachne muelleri	0.1	30		
Pluchea ferdinandi-muelleri	0.1	80	MBU21-17	
Scaevola amblyanthera var. *centralis*	0.1	30	MBU21-14	Corolla pale blue with yellow centre. PLDK: sens. lat.
Senna artemisioides subsp. *oligophylla*	0.1	50	MBU21-09	
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.1	75	MBU21-19	MET det.
Senna artemisioides subsp. *oligophylla* x subsp. *helmsii*	0.1	35		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	70	MBU21-18	MET det.
Senna symonii	0.1	90		
Sida echinocarpa	0.1	75	MBU21-16	
Solanum diversiflorum	0.1	20		
Stemodia grossa	0.1	30		
Swainsona stenodonta	0.1	10	MBU21-02	
Trichodesma zeylanicum var. *zeylanicum*	0.1	60		
Triodia longiceps	0.1	30		
Triodia wiseana	60	60	MBU21-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU22

Described by AL,MET **Date** 06-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 198072 mE, 7597430 mN 120.081937°E, -21.700861°S

Habitat Gentle east facing slope below ridge, almost in valley floor.

Soil Reddish brown sandy clay loam.

Rock Type Colluvium.

Vegetation *Grevillea pyramidalis* subsp. *leucadendron, Acacia inaequilatera* scattered tall shrubs over *A. bivenosa, A. ancistrocarpa* shrubland over *A. trachycarpa* low shrubland over *Triodia epactia* open hummock grassland.

Veg Condition Excellent to Very Good: 2 x **Cenchrus*; cattle scats and tracks present.

Fire Age Burnt 1-2 years ago.

Notes Veg description established from burnt stems and regrowth.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	20	MBU22-29	
Acacia ancistrocarpa	0.1	50	MBU22-10	
Acacia inaequilatera	0.1	40		
Acacia trachycarpa	0.5	50	MBU22-19	Regrowth.
Alternanthera nana	0.1	10	MBU22-31	
Aristida contorta	0.1	15		
Aristida holathera var. *holathera*	0.1	50	MBU22-37	
Arivela viscosa	0.1	20	MBU22-02	
Boerhavia burbidgeana	0.1	10	MBU22-15	Prostrate 1m wide.
Bonamia erecta	0.1	35	MBU22-38	
Bonamia pannosa	0.1	10	MBU22-26	
Bulbostylis barbata	0.1	5	MBU22-21	
**Cenchrus ciliaris*	0.1	25		
Chrysopogon fallax	0.1	100	MBU22-35	
Corchorus parviflorus	15	60	MBU22-08	
Dactyloctenium radulans	0.1	10	MBU22-28	
Enneapogon polyphyllus	0.1	25	MBU22-20	PLDK: sens. lat.
Eragrostis cumingii	0.1	10	MBU22-30	
Eriachne pulchella	0.1	10	MBU22-07	Sens lat.
Euphorbia australis var. *subtomentosa*	0.1	10	MBU22-06	Cyathia pale orange. Stems arching.
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU22-14	
Goodenia microptera	8	30	MBU22-05	
Gossypium australe	0.1	12		
Grevillea pyramidalis subsp. *leucadendron*	0.1	60		Regrowth.
Heliotropium cunninghamii	0.1	20	MBU22-04	
Heliotropium pachyphyllum	2	25	MBU22-16	
Heliotropium tenuifolium	0.1	25	MBU22-36	
Hibiscus sturtii var. *campylochlamys*	0.1	12	MBU22-11	
Indigofera monophylla	0.1	25	MBU22-13	PLDK: sens. lat.
Isotropis atropurpurea	0.1	40	MBU22-34	
Perotis rara	0.1	5	MBU22-25	
Pluchea tetranthera	0.1	40		
Polygala glaucifolia	0.1	2	MBU22-27	
Portulaca oleracea/intraterranea	0.1	5	MBU22-32	PLDK: seeds faintly nippled.
Pterocaulon sphacelatum	0.1	15	MBU22-22	
Ptilotus astrolasius	0.1	35		
Ptilotus exaltatus	0.1	4		
Ptilotus fusiformis	0.1	50		
Senna notabilis	0.1	25	MBU22-01	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	10	MBU22-09, -39	Ferruginous form.
Solanum diversiflorum	0.1	30		
Solanum horridum	0.1	10	MBU22-23	Leaves slightly yellow.
Sporobolus australasicus	0.1	12		
Streptoglossa bubakii	0.1	25	MBU22-18	
Synaptantha tillaeacea var. *tillaeacea*	0.1	15	MBU22-24	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	20	MBU22-03	Flowers pale orange. PLDK: atypical indumentum, R. Butcher.

Species	Cover	Height	Specimen	Notes
Tribulus hirsutus	0.1	10	MBU22-12	
Trigastrotheca molluginea	0.5	15		
Triodia epactia	10	30	MBU22-17	PLDK: sens. lat.
Yakirra australiensis var. *australiensis*	0.1	10	MBU22-33	



Marble Bar Rd Upgrade **Site** MBU23

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 198296 mE, 7594048 mN 120.083484°E, -21.731415°S

Habitat Steep slope of a rounded spur from a low ridge; (W-facing).

Soil Reddish brown (2.5YR 4/4) silty loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Indigofera monophylla* scattered low shrubs over *Triodia epactia* closed hummock grassland.

Veg Condition Excellent: no weeds; possible minor disturbance in NW corner but not significant.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.5	400	MBU23-02	
Amaranthus undulatus	0.1	20	MBU23-10	
Arivela viscosa	0.1	100	MBU23-05	Dead.
Bonamia pilbarensis	0.1	15	MBU23-04	Flowers pale blue with white throat.
Corchorus parviflorus	0.1	50	MBU23-11	
Cucumis variabilis	0.1	60	MBU23-06	Indumentum atypical (coarse, dense); leaves broad.
Cymbopogon ambiguus	0.1	110	MBU23-07	
Eriachne mucronata (typical form)	0.1	40	MBU23-13	NI=1.
Gossypium australe	0.1	90		NI=2. Whim Creek form: greyer indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	160	MBU23-15	Sterile; subsp. applied from flowering collections.
Hakea lorea subsp. *lorea*	0.1	170	MBU23-12	Young plant. PLDK: sens. lat.
Indigofera monophylla	1	70	MBU23-03	PLDK: sens. lat.
Rhynchosia minima	0.1	30	MBU23-08	
Themeda triandra	0.1	60	MBU23-09	
Tinospora smilacina	0.1	350		
Tribulus suberosus	0.1	70		Bark corky.
Trichodesma zeylanicum var. *zeylanicum*	0.1	100		
Triodia brizoides	0.1	20	MBU23-14	Less than 5 plants.
Triodia epactia	75	60	MBU23-01	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU24

Described by SC **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 198825 mE, 7591238 mN 120.088082°E, -21.756860°S

Habitat Rocky boulder hill.

Soil Reddish brown clay loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Acacia inaequilatera,* (*Grevillea pyramidalis* subsp. *leucadendron*) scattered tall shrubs over *Indigofera monophylla,* (*Corchorus parviflorus*) scattered low shrubs over *Triodia epactia* hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia colei	0.1	150	REL08-01=	PLDK: sterile; var. not det.
Acacia inaequilatera	0.5	400		
Bonamia pilbarensis	0.1	5	MBU24-08	Purple flowers.
Cajanus cinereus	0.1	60	MBU24-04	
Corchorus parviflorus	0.5	40	MBU24-02	
Cullen stipulaceum	0.1	60	MBU24-05	MET det: atypical, narrow stipules.
Cymbopogon ambiguus	0.1	60	MBU24-06	
Eriachne mucronata (typical form)	0.1	30	MBU24-09	
Gossypium australe	0.1	50		
Grevillea pyramidalis subsp. *leucadendron*	0.1	300		
Grevillea wickhamii subsp. *hispidula*	0.1	250		Sterile; subsp. applied from flowering collections.
Indigofera monophylla	1	40	MBU24-03	PLDK: sens. lat.; type 3 (small leaf 15 x 10 mm, small inconspicuous stipule; hairs partly appressed, partly dendritic upright).
Indigofera monophylla	0.1	50	MBU24-11	PLDK: sens. lat.
Senna glutinosa subsp. *glutinosa*	0.1	40		
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	0.1	20	MBU24-10	PLDK: atypical indumentum, R. Butcher.
Tinospora smilacina	0.1	5	MBU24-07	
Tribulus suberosus	0.1	40		
Triodia epactia	40	30	MBU24-01	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU25
Described by SC **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 200119 mE, 7587445 mN 120.099892°E, -21.791305°S
Habitat Open low undulating foothill.
Soil Reddish brown sandy clay loam.
Rock Type Hardey Formation; rhyodacite.
Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* hummock grassland.
Veg Condition Excellent.
Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.5	210		
Acacia tetragonophylla	0.1	70	MBU25-01	
Alysicarpus muelleri	0.1	15	MBU15-01=	
Aristida contorta	0.1	10		
Arivela viscosa	0.1	5		
Boerhavia coccinea	0.1	2	REL07-07=	Sterile.
Bonamia pilbarensis	0.1	5	MBU24-08=	
Bulbostylis barbata	0.1	5		
Carissa lanceolata	0.1	70	MBU15-09=	
Corchorus parviflorus	0.1	50	MBU24-02=	
Enneapogon polyphyllus	0.1	20	MBU25-03	PLDK: sens. lat.
Eriachne pulchella	0.1	5		
Euphorbia vaccaria var. *vaccaria*	0.1	1	MBU14-04=	Sterile.
Evolvulus alsinoides	0.1	2		Sterile.
Fimbristylis dichotoma	0.1	10	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Gomphrena cunninghamii	0.1	2	MBU25-04	
Goodenia lamprosperma	0.1	20	MBU25-07	
Gossypium australe	0.1	40		
Grevillea wickhamii subsp. *hispidula*	0.1	210		Sterile; subsp. applied from flowering collections.
Hakea lorea subsp. *lorea*	0.1	110		
Heliotropium cunninghamii	0.1	10	MBU25-05	
Hybanthus aurantiacus	0.1	5		
Indigofera colutea	0.1	2		
Indigofera monophylla	0.1	50	MBU24-11=	PLDK: sens. lat.
Pluchea dentex	0.1	30	MBU16-09=	
Pluchea tetranthera	0.1	20	MBU25-08	
Polycarpaea corymbosa var. *corymbosa*	0.1	5	MBU25-11	
Portulaca oleracea/intraterranea	0.1	5	MBU25-06	PLDK: seeds distinctly nippled.
Senna artemisioides subsp. *helmsii*	0.1	60		
Solanum horridum	0.1	20	MBU25-10	
Stemodia grossa	0.1	20		
Trigastrotheca molluginea	0.1	10		
Triodia epactia	35	30	MBU25-02	PLDK: sens. lat.
Tripogonella loliiformis	0.1	10	MBU25-09	



Marble Bar Rd Upgrade **Site** MBU26

Described by SC **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201757 mE, 7584018 mN 120.115098°E, -21.822504°S

Habitat Low undulating foothills with rough rocky substrate.

Soil Reddish brown (2.5YR 4/4) sandy loam.

Rock Type Hardey Formation; sandstone.

Vegetation *Acacia orthocarpa* shrubland over *Triodia epactia* hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	10		
Acacia orthocarpa	11	150	MBU26-01	Shrub. PLDK: Bushy form.
Corchorus parviflorus	0.1	60	MBU26-02	
Senna glutinosa subsp. *glutinosa*	0.1	150		
Triodia epactia	31	40	MBU26-03	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU27

Described by SC **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203548 mE, 7580465 mN 120.131766°E, -21.854866°S

Habitat Medium undulating rocky hills, with dissecting drainage lines.

Soil Reddish brown clay loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Acacia bivenosa* shrubland over *Triodia brizoides,* (*T. epactia, T. wiseana*) hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.5	300	MBU27-03	NI=45.
Acacia bivenosa	12	110		
Acacia inaequilatera	0.1	50		
Acacia orthocarpa	0.5	110	MBU26-01=	PLDK: Bushy form.
Bulbostylis barbata	0.1	5		
Fimbristylis dichotoma	0.1	15	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Maireana melanocoma	0.1	20	MBU02-05=	Dead; sterile.
Ptilotus calostachyus	0.1	60		
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.1	60	MBU27-04	
Senna glutinosa subsp. *glutinosa*	0.1	100		
Senna glutinosa subsp. *pruinosa*	0.1	80		
Tribulus suberosus	0.1	30		
Triodia brizoides	25	30	MBU27-01	
Triodia epactia	5	30	MBU26-03=	PLDK: sens. lat.
Triodia wiseana	1	30	MBU27-02	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU28

Described by SC **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203086 mE, 7578748 mN 120.126990°E, -21.870281°S

Habitat Low undulating hills.

Soil Reddish brown clay loam.

Rock Type Mosquito Creek Formation; wacke/shale?

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia aphanoclada, Senna artemisioides* subsp. *oligophylla* x *S. symonii* scattered tall shrubs over *A. bivenosa* scattered shrubs over *Triodia brizoides* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Small hill; larger area of drainage to the E is dominated by *Acacia trachycarpa* scrub over *Triodia longiceps* and *T. epactia.*

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.5	350	MBU27-03=	NI=78.
Acacia bivenosa	1	150		
Acacia hilliana	0.1	60	MBU28-01	
Acacia synchronicia	0.1	150	MBU28-04	PLDK: sens. lat.
Bulbostylis barbata	0.1	5		
Eriachne pulchella	0.1	5		
Eucalyptus leucophloia subsp. *leucophloia*	0.1	400	MBU28-03	Overhanging; rooted outside quadrat.
Fimbristylis simulans	0.1	5	SC21=	
Grevillea wickhamii subsp. *hispidula*	0.1	120		Sterile; subsp. applied from flowering collections.
Hakea lorea subsp. *lorea*	0.1	70		
Indigofera monophylla	0.1	110	MBU28-02	PLDK: sens. lat.
Pluchea tetranthera	0.1	30	MBU25-08=	
Ptilotus astrolasius	0.1	20	SC22=	
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.5	200	MBU27-04=	
Senna glutinosa subsp. *glutinosa*	0.1	200		
Sporobolus australasicus	0.1	5		
Tribulus suberosus	0.1	30		
Trigastrotheca molluginea	0.1	10		
Triodia brizoides	40	30	MBU27-01=	
Triodia longiceps	0.1	40		
Triodia wiseana	0.1	20	MBU27-02=	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU29

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 199214 mE, 7589761 mN 120.091570°E, -21.770253°S

Habitat Moderate to steep slope on side of low ridge; E-facing.

Soil Dark red (2.5YR 3/6) silty clay loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Triodia epactia* hummock grassland.

Veg Condition Excellent.

Fire Age Very long unburnt.

Notes DBCA Pilbara survey site located here.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.1	100	MBU29-02	
Alysicarpus muelleri	0.1	10	MBU29-06	Juvenile.
Bonamia pilbarensis	0.1	15	MBU29-03	
Cullen stipulaceum	0.1	50	MBU29-09	Regrowth. MET det: atypical, narrow stipules.
Cymbopogon ambiguus	0.1	70	MBU29-10	
Ehretia saligna var. *saligna*	0.1	160		
Gossypium australe	0.1	45		NI=3. Whim Creek form: greyer indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	200		
Grevillea wickhamii subsp. *hispidula*	0.1	350	MBU29-04	
Indigofera monophylla	0.1	60	MBU23-03=	
Rhynchosia minima	0.1	70	MBU29-07	
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.1	70	MBU29-08	MET det.
Tephrosia virens	0.1	140	MBU29-11	
Trichodesma zeylanicum var. *zeylanicum*	0.1	60	MBU29-05	
Triodia epactia	50	60	MBU29-01	PLDK: sens. lat.
Tripogonella loliiformis	0.1	15	MBU29-12	



Marble Bar Rd Upgrade **Site** MBU30

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 80 x 10 m

MGA Zone 51 200936 mE, 7586073 mN 120.107537°E, -21.803823°S

Habitat Creek bed; high flow area.

Soil Weak red (2.5YR 5/2) loamy alluvial sand.

Rock Type N/A.

Vegetation *Eucalyptus victrix* low open woodland over *Acacia trachycarpa* tall open shrubland over *Triodia longiceps* very open hummock grassland.

Veg Condition Poor: cattle and weeds present; flood damage.

Fire Age Very long unburnt.

Notes Quadrat established to fit irregular area of high flow creek bed. Only one plant of soft spinifex; consider excluding for floristic analysis.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	90	MBU30-42	
Acacia coriacea subsp. *pendens*	0.1	90		Juvenile.
Acacia trachycarpa	10	300		flood killed.
Aeschynomene indica	0.1	25	MBU30-06	
Alternanthera nana	0.1	20		
Amaranthus undulatus	0.1	40	MBU30-04, -35	
Arivela viscosa	0.1	40	MBU30-09. -33	
Bergia pedicellaris	0.1	5	MBU30-38	
**Bidens bipinnata*	0.1	25	MBU30-39	
Boerhavia burbidgeana	0.1	10	MBU30-31	
Boerhavia coccinea	0.1	12	MBU30-03	Sens lat.
Bulbostylis barbata	0.1	15	MBU30-48	
Calandrinia tepperiana	0.1	12	MBU30-55	PLDK: petals <7. Det confirmed by M Hislop (WAH).
Cassytha capillaris	0.1	40	MBU30-16	Creeper.
**Cenchrus ciliaris*	0.1	20		
**Cenchrus setiger*	0.1	60	MBU30-05	
Chloris pumilio	0.1	25	MBU30-41	
Chrysopogon fallax	0.1	70	MBU30-10	
Commelina ensifolia	0.1	30	MBU30-52	
Corchorus parviflorus	0.1	70	MBU30-13	
Corchorus tridens	0.1	6	MBU30-51	
Cucumis picrocarpus	0.1	40	MBU30-08	
Cucumis variabilis	0.1	50	MBU30-07	
Cullen leucanthum	0.1	20	MBU30-56	Juvenile.
Cyperus bulbosus	0.1	20	MBU30-47	Det by M Hislop (WAH).
Cyperus iria	0.1	40	MBU30-25	
Cyperus squarrosus	0.1	5	MBU30-37	
Dactyloctenium radulans	0.1	5		
**Echinochloa colona*	0.1	55	MBU30-26	
**Eragrostis cilianensis*	0.1	25	MBU30-21	
Eragrostis crateriformis	0.1	40	MBU30-28	
Eragrostis cumingii	0.1	15	MBU30-22	
Eragrostis leptocarpa	0.1	20	MBU30-23	
Eucalyptus victrix	10	10		
Eulalia aurea	0.1	15	MBU30-11	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	1	MBU30-50	Prostrate.
Euphorbia trigonosperma	0.1	30	MBU30-17	Erect herb.
Evolvulus alsinoides var. *decumbens*	0.1	30	MBU30-20	
Fimbristylis depauperata	0.1	35	MBU30-24	
Fimbristylis microcarya	0.1	30	MBU30-27	
Gomphrena cunninghamii	0.1	20	MBU30-49	
Goodenia lamprosperma	0.1	25		
Gossypium australe	0.1	15		Juvenile. Burrup Peninsula form: greener indumentum.
Hybanthus aurantiacus	0.1	25	MBU30-15	PLDK: sens. lat.
Indigofera hirsuta	0.1	10	MBU30-45A	Juvenile. MET det.
Indigofera linifolia	0.1	10		
Indigofera linnaei	0.1	30	MBU30-30	

Species	Cover	Height	Specimen	Notes
Indigofera monophylla	0.1	100	MBU30-12	
Ipomoea muelleri	0.1	20	Flowers mauve. Creeper.	
Ipomoea polymorpha	0.1	10	MBU30-19	Annual.
Ipomoea racemigera	0.1	50	MBU30-02	Flowers white.
Ludwigia perennis	0.1	50	MBU30-54	
Paspalidium rarum	0.1	12	MBU30-36	
Perotis rara	0.1	10		
Phyllanthus maderaspatensis	0.1	30		
Pluchea dentex	0.1	15	MBU30-32	
Pluchea rubelliflora	0.1	15	MBU30-29	
Polymeria ambigua	0.1	10	MBU30-40, -44	
Portulaca oleracea/intraterranea	0.1	5	MBU30-18	PLDK: seeds faintly nippled.
Sida fibulifera	0.1	15	MBU30-45	Spreading to 45cm. PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	20	MBU30-46	
Solanum diversiflorum	0.1	20		
Sorghum plumosum var. *plumosum*	0.1	118	MBU30-43	
Stemodia grossa	0.1	7		
Trianthema triquetrum	0.1	8	MBU30-34	
Triodia epactia	0.1	50	MBU30-53	PLDK: sens. lat.
Triodia longiceps	10	60	MBU30-01	Blue green leaves.
Vigna lanceolata var. *lanceolata*	0.1	40	MBU30-14	Creeper.
Waltheria indica	0.1	40		



Marble Bar Rd Upgrade **Site** MBU31

Described by MM,RM,AL **Date** 04-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201709 mE, 7574192 mN 120.112850°E, -21.911158°S

Habitat Gravelly plain / very gradual footslope off low ?basalt range of hills to E; gentle slope to W.

Soil Reddish brown (2.5YR 4/4) fine sandy loam.

Rock Type Mosquito Creek Formation; siltstone, chert, quartz; large patches of gravel and pebbles.

Vegetation *Acacia bivenosa* scattered tall shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Excellent: old cattle scat; old drink can.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	1.5	230		
Atriplex codonocarpa	0.1	20	MBU31-10	
Corchorus parviflorus	0.1	60	MBU31-09	
Cynodon prostratus	0.1	6	MBU31-11	
Duperreya commixta	0.1	150		
Goodenia nuda	0.1	40	MBU31-07	Det confirmed by M Hislop (WAH).
Grevillea wickhamii subsp. *hispidula*	0.1	180		Sterile; subsp. applied from flowering collections.
Maireana ? eriosphaera	0.1	30	MBU31-12	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Maireana melanocoma	0.1	55	MBU31-03	
Pluchea rubelliflora	0.1	35	MBU31-04	
Pterocaulon serrulatum var. *velutinum*	0.1	25	MBU31-05	MET det.
Pterocaulon sphacelatum	0.1	25	MBU31-08	
Sclerolaena densiflora	0.1	40	MBU31-02	PLDK: sens. lat.
Sclerolaena lanicuspis	0.1	10	MBU31-13	Det by M Hislop (WAH).
Senna symonii	0.1	80	MBU31-14	
Sporobolus australasicus	0.1	15		
Trianthema triquetrum	0.1	2	MBU31-06	
Triodia longiceps	45	60	MBU31-01	



Marble Bar Rd Upgrade **Site** MBU32

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 202573 mE, 7583137 mN 120.122824°E, -21.830592°S

Habitat Low-lying area between ridges; possible flow area.

Soil Light reddish brown (2.5YR 6/4) sandy loam.

Rock Type N/A; mapped as Calcrete.

Vegetation Acacia trachycarpa scattered low shrubs over Triodia longiceps very open hummock grassland.

Veg Condition Very Good: cattle tracks, scats; *Cenchrus.

Fire Age Burnt 2-3 years ago.

Notes Naturally open site. Less than 1% combined of 2 taller Sida spp., but probably short-lived and responding to rainfall.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.1	230	MBU32-05	
Acacia synchronicia	0.1	60	MBU32-13	PLDK: sens. lat.
Acacia trachycarpa	0.1	100		Most killed by fire.
Arivela viscosa	0.1	5		
Boerhavia burbidgeana	0.1	10	MBU32-15	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	10	MBU32-22	Sens lat.
Bulbostylis barbata	0.1	10	MBU32-21	
Calandrinia stagnensis	0.1	4	MBU32-19	
**Cenchrus ciliaris*	0.1	25		
Corchorus parviflorus	0.1	60	MBU32-02	
Dactyloctenium radulans	0.1	10		
Eragrostis crateriformis	0.1	30	MBU32-23	PLDK: matches MBU54-46.
Eragrostis cumingii	0.1	10		
Eragrostis dielsii	0.1	20	MBU32-25	Uncommon locally. Det confirmed by M Hislop (WAH).
Euphorbia trigonosperma	0.1	8	MBU32-09	
Evolvulus alsinoides var. *decumbens*	0.1	20	MBU32-32	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU32-17	
Fimbristylis dichotoma	0.1	20	MBU32-04	PLDK: sens. lat.; styles wholly ciliate.
Gomphrena cunninghamii	0.1	4	MBU32-28	
Goodenia microptera	0.1	3	MBU32-20	
Heliotropium cunninghamii	0.1	15	MBU32-27	
Hibiscus sturtii var. *grandiflorus*	0.1	30	MBU32-24	
Indigofera colutea	0.1	5	MBU32-08	
Paraneurachne muelleri	0.1	40		
Paspalidium rarum	0.1	10	MBU32-14	
Perotis rara	0.1	6		
Phyllanthus maderaspatensis	0.1	1		
Pluchea ferdinandi-muelleri	0.1	40		
Pluchea tetranthera	0.1	50		
Polymeria ambigua	0.1	25	MBU32-06, -29	
Portulaca oleracea/intraterranea	0.1	4	MBU32-07	PLDK: seeds nippled.
Ptilotus exaltatus	0.1	4		
Sclerolaena costata	0.1	15	MBU32-30	
Senna artemisioides subsp. *helmsii*	0.1	5		
Sida arsiniata	0.1	35	MBU32-18	
Sida clementii	0.1	40	MBU32-12	
Sida fibulifera	0.1	20	MBU32-03	PLDK: sens. lat.
Sida sp. L (A.M. Ashby 4202)	0.1	20	MBU32-16	
Sporobolus actinocladus	0.1	40	MBU32-31	
Sporobolus australasicus	0.1	15		
Streptoglossa decurrens	0.1	5	MBU32-10	
Trianthema triquetrum	0.1	10	MBU32-11	
Tribulus hirsutus	0.1	10	MBU32-26	
Trigastrotheca molluginea	0.1	20		
Triodia epactia	0.1	45	MBU32-33	PLDK: sens. lat.
Triodia longiceps	9	50	MBU32-01	



Marble Bar Rd Upgrade **Site** MBU33
Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 203480 mE, 7579455 mN 120.130926°E, -21.863968°S
Habitat Gentle slope (E-facing).
Soil Red (2.5YR 4/6) silty loam.
Rock Type Colluvium.
Vegetation *Triodia brizoides* hummock grassland.
Veg Condition Very Good: cattle scats, tracks.
Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.1	110		N=5. Number not recorded; estimated.
Acacia synchronicia	0.1	220	MBU33-04	Shrub. PLDK: sens. lat.
Eucalyptus leucophloia subsp. *leucophloia*	0.1	140		Straggly. Other Euc leucs outside quadrat are 400cm tall.
Maireana carnosa	0.1	15	MBU33-05	M Hislop (WAH): Tentative ID of sterile specimen.
Maireana melanocoma	0.1	30	MBU33-01	
Pluchea tetranthera	0.1	100		1 plant in slight depression.
Salsola australis	0.1	40		Dead.
Sclerolaena densiflora	0.1	15	MBU33-03	PLDK: sens. lat.; mostly sterile or immature fruits.
Senna symonii	0.1	200		
Triodia brizoides	60	50	MBU33-02	
Triodia longiceps	0.5	110	MBU33-06	



Marble Bar Rd Upgrade **Site** MBU34

Described by RW,RM **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 202692 mE, 7582612 mN 120.123880°E, -21.835349°S

Habitat Undulating plain, dissected by a minor flowline; adjacent to low to medium hills.

Soil Dark reddish brown (5YR 3/4) fine sandy loam.

Rock Type Hardey Formation; sandstone, shale.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *A. trachycarpa* open shrubland over *Triodia epactia* hummock grassland.

Veg Condition Very Good: **Cenchrus* present; signs of cattle.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	90		
Acacia inaequilatera	0.5	400		
Acacia trachycarpa	3	170	MBU10-01=	
Boerhavia coccinea	0.1	5	MBU34-08	Juvenile. Sens lat.
Bonamia pilbarensis	0.1	20	MBU34-06	
**Cenchrus ciliaris*	0.1	10		NI=25
Corchorus parviflorus	0.1	30	MBU10-08A=	
Enneapogon caerulescens	0.1	20	MBU19-02=	
Eragrostis cumingii	0.1	30	MBU34-22	
Eriachne pulchella	0.1	5		
Indigofera monophylla	0.1	110		NI=5.
Portulaca oleracea/intraterranea	0.1	5		
Ptilotus clementii	0.1	20		
Rhynchosia minima	0.1	30		
Sclerolaena costata	0.1	15	MBU34-02	
Senna artemisioides subsp. *helmsii*	0.1	70	MBU34-01	
Senna glutinosa subsp. x *luerssenii*	0.1	60	MBU34-04	
Sida echinocarpa	0.1	25	MBU34-03. -05	
Solanum cleistogamum	0.1	20	MBU34-07	
Sporobolus australasicus	0.1	5		
Trichodesma zeylanicum var. *zeylanicum*	0.1	70		
Triodia epactia	35	30	MBU19-01=	PLDK: sens. lat.
Waltheria indica	0.1	3		



Marble Bar Rd Upgrade **Site** MBU35

Described by RW,RM **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203180 mE, 7579228 mN 120.127985°E, -21.865966°S

Habitat Creek bed and bank.

Soil Dark reddish brown (5YR 3/3) alluvial loamy sand.

Rock Type Chert, mudstone, sandstone, quartz.

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia, Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* tall open shrubland over *Acacia trachycarpa, Androcalva luteiflora* open shrubland over *Triodia epactia, (T. longiceps*) very open hummock grassland with *Chrysopogon fallax* very open tussock grassland.

Veg Condition Very Good: cattle present; a few weeds.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	60	MBU35-04	
Acacia bivenosa	0.1	190		
Acacia eriopoda	0.1	220	MBU35-27	PLDK: leaves longer; marginal veins.
Acacia maitlandii	0.1	130	MBU35-02	
Acacia spondylophylla	0.1	90		
Acacia trachycarpa	5	140	MBU10-01=	
Acacia trachycarpa x tumida var. *pilbarensis*	0.1	170	MBU35-19	
Acacia tumida var. *pilbarensis*	8	450	MBU35-24	
Androcalva luteiflora	3	190	MBU35-25	
Aristida contorta	0.1	20		
Aristida holathera var. *holathera*	0.1	30		
Aristida pruinosa	0.1	60	MBU35-23	Lemma furrow smooth. Det confirmed by M Hislop (WAH): lemma furrows are smooth rather than tuberculate, however that character is known to 'wobble'.
Bonamia erecta	0.1	25	MBU19-09=	
Bulbostylis barbata	0.1	5		
Calandrinia sp.	0.1	5	MBU35-01	Inadequate material.
Calytrix carinata	0.1	130	MBU35-06	Sens lat.
**Cenchrus ciliaris*	0.1	30		NI=30.
**Cenchrus setiger*	0.1	30		NI= 2
Chrysopogon fallax	5	60		
Corchorus parviflorus	0.1	35	MBU10-08A=	
Corymbia hamersleyana	0.5	500		
Cymbopogon ambiguus	0.1	60	MBU35-16	
Dampiera candicans	0.1	30		
Duperreya commixta	0.1	30		
Eragrostis cumingii	0.1	20		
Eragrostis eriopoda	0.1	30	MBU35-05	
Eragrostis olida	0.1	60	MBU35-26	Det confirmed by M Hislop (WAH).
Eriachne benthamii	0.1	30	MBU35-18	
Eucalyptus leucophloia subsp. *leucophloia*	0.5	400		
Eulalia aurea	0.1	50		
Evolvulus alsinoides var. *decumbens*	0.1	20		
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Fimbristylis microcarya	0.1	40	MBU35-20	PLDK: sens. lat.; nutlets without or with poorly formed tubercles. Nut without projections.
Gonocarpus ephemerus	0.1	15	MBU35-14	
Goodenia cusackiana	0.1	5	MBU35-07	
Goodenia microptera	0.1	30	MBU35-09	
Goodenia nuda	0.1	20	MBU35-15	
Goodenia stobbsiana	0.1	35	MBU35-17	
Grevillea wickhamii subsp. *hispidula*	0.1	210	MBU35-12	

Species	Cover	Height	Specimen	Notes
Hakea lorea subsp. *lorea*	0.1	200	MBU35-13	PLDK: sens. lat.
Hibiscus sturtii var. *campylochlamys*	0.1	20	MBU35-03	
Hybanthus aurantiacus	0.1	40		
Indigofera monophylla	0.1	70		NI= 27.
Paraneurachne muelleri	0.1	35		
Paspalidium rarum	0.1	20	MBU35-08	
Petalostylis labicheoides	0.1	210		
Pluchea dentex	0.1	30		
Ptilotus fusiformis	0.1	30	MBU35-21	
Santalum lanceolatum	0.1	170	MBU35-10	
Senna symonii	0.1	90	MBU35-11	
Sesbania cannabina	0.1	60		
Solanum diversiflorum	0.1	30		
Sporobolus australasicus	0.1	5		
Themeda triandra	0.1	120		
Trigastrotheca molluginea	0.1	20		
Triodia epactia	5	30	MBU19-01=	PLDK: sens. lat.
Triodia longiceps	2	40		
Waltheria indica	0.1	25		



Marble Bar Rd Upgrade **Site** MBU36

Described by RW,RM **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201794 mE, 7575271 mN 120.113868°E, -21.901436°S

Habitat Plain surrounded by low hills.

Soil Red (2.5YR 4/6) sandy loam.

Rock Type Mosquito Creek Formation; quartz chunks.

Vegetation *Triodia longiceps* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Dactyloctenium radulans	0.1	2		
Fimbristylis dichotoma	0.1	5	MBU36-06	PLDK: sens. lat.; styles wholly ciliate.
Maireana ? eriosphaera	0.1	20	MBU36-05A	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Melaleuca eleuterostachya	0.1	110	MBU36-02	
Pluchea tetranthera	0.1	35	MBU36-03	
Sclerolaena cuneata	0.1	20	MBU36-07	
Sclerolaena densiflora	0.1	20	MBU36-05B	PLDK: sens. lat.
Sclerolaena hostilis	0.1	30	MBU36-04	
Sporobolus australasicus	0.1	4		
Trianthema triquetrum	0.1	1	MBU36-01	
Triodia longiceps	55	50		



Marble Bar Rd Upgrade **Site** MBU37

Described by RW,RM **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201386 mE, 7571814 mN 120.109294°E, -21.932560°S

Habitat Rocky hills with saddle.

Soil Dark reddish brown (5YR 3/4) clayey sand.

Rock Type Mount Roe Basalt; dolerite.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *A. acradenia*, *Indigofera monophylla,* (*Senna artemisioides subs*p. *oligophylla*) open shrubland over *Triumfetta appendiculata, Senna glutinosa* subsp. *glutinosa* x scattered low shrubs over *Triodia epactia* open hummock grassland.

Veg Condition Excellent to Very Good: some weeds but otherwise in Excellent condition.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	35	MBU37-18	PLDK: sens. lat.
Acacia acradenia	3	130	MBU37-08	
Acacia inaequilatera	0.5	550		
**Aerva javanica*	0.1	80		NI=20.
Amaranthus cuspidifolius	0.1	25	MBU37-10	
Aristida burbidgeae	0.1	40	MBU37-19	
Arivela viscosa	0.1	30		
Atalaya hemiglauca	0.1	330		
Boerhavia coccinea	0.1	30	MBU37-20	Sens lat.
**Cenchrus ciliaris*	0.1	40		NI=20.
**Cenchrus setiger*	0.1	40		NI=5
Corchorus parviflorus	0.1	10	MBU37-13	
Cymbopogon ambiguus	0.1	110	MBU37-06	
Enneapogon lindleyanus	0.1	40	MBU37-15	
Euphorbia boophthona	0.1	20	MBU37-27	Sterile.
Euphorbia careyi	0.1	15	MBU37-04	
Evolvulus alsinoides	0.1	15		Sterile.
Gomphrena cunninghamii	0.1	30	MBU37-23	
Gossypium australe	0.1	110	MBU37-24	Whim Creek form: greyer indumentum.
Hibiscus coatesii	0.1	20	MBU37-03	
Hibiscus sturtii var. *campylochlamys*	0.1	25	MBU37-21	
Indigofera monophylla	2	120	MBU37-11	NI=100. PLDK: sens. lat.
Paraneurachne muelleri	0.1	30		
Paspalidium clementii	0.1	20	MBU37-22	
Ptilotus clementii	0.1	15		
Ptilotus obovatus var. *obovatus*	0.1	60	MBU37-14	
Rhynchosia minima	0.1	10		
Senna artemisioides subsp. *oligophylla*	1	130	MBU37-07, 25	
Senna glutinosa subsp. *glutinosa* x	1	40	MBU37-26	MET det.: possibly hybrid with *S. symonii.*
Solanum diversiflorum	0.1	5		
Sporobolus australasicus	0.1	10		
Swainsona decurrens	0.1	10	MBU37-28	Pea.
Themeda triandra	0.1	35	MBU37-05	
Trachymene oleracea subsp. *oleracea*	0.1	35	MBU37-01	
Trianthema triquetrum	0.1	1	MBU37-17	
Tribulus hirsutus	0.1	5	MBU37-02	
Tribulus suberosus	0.1	50		
Trichodesma zeylanicum var. *zeylanicum*	0.1	5		
Triodia brizoides	0.1	40	MBU37-12	
Triodia epactia	28	40	MBU37-16	PLDK: sens. lat.
Triumfetta appendiculata	1	70	MBU37-09	



Marble Bar Rd Upgrade **Site** MBU38

Described by RW,RM **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201057 mE, 7571145 mN 120.105990°E, -21.938540°S

Habitat Lower slope, undulating plain.

Soil Reddish brown (5YR 4/4) sandy loam.

Rock Type Mosquito Creek Formation; quartz, ?basalt.

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia aphanoclada* scattered tall shrubs over *A. synchronicia, A. bivenosa* scattered shrubs over *Triodia longiceps* open hummock grassland.

Veg Condition Excellent: old track in quadrat, but no impacts on vegetation; 1 x **Aerva javanica*.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Abutilon sp.	0.1	3	MBU38-11	Juvenile; inadequate material.
Acacia aphanoclada	0.5	400	MBU38-01	NI=40. Number not recorded; estimated.
Acacia aphanoclada x pyrifolia var. *pyrifolia*	0.1	230	MBU38-13	
Acacia bivenosa	1	120		
Acacia synchronicia	1	200	MBU38-12	PLDK: sens. lat.
**Aerva javanica*	0.1	35		NI=1.
Corchorus parviflorus	0.1	30	MBU38-07	
Cucumis variabilis	0.1	110		
Enneapogon caerulescens	0.1	20	MBU38-06	
Eucalyptus leucophloia subsp. *leucophloia*	0.5	320		
Euphorbia biconvexa	0.1	10	MBU38-09	
Heliotropium chrysocarpum	0.1	30	MBU38-04	
Ptilotus clementii	0.1	3		
Ptilotus exaltatus	0.1	20	MBU38-05	
Salsola australis	0.1	5		
Sclerolaena eriacantha	0.1	20	MBU38-02	
Senna glutinosa subsp. *x luerssenii*	0.1	120	MBU38-08	
Senna symonii	0.1	140	MBU38-03	
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	15	MBU38-10	PLDK: white indumentum form.
Sporobolus australasicus	0.1	5		
Trianthema triquetrum	0.1	10	MBU37-17=	
Tribulus hirsutus	0.1	5		
Triodia longiceps	26	50		



Marble Bar Rd Upgrade **Site** MBU39

Described by RW,RM **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 200884 mE, 7568831 mN 120.103893°E, -21.959390°S

Habitat Hill slope with small saddle.

Soil Dark reddish brown (5YR 3/2) clayey sand.

Rock Type Mount Roe Basalt; dolerite.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea pyramidalis* subsp. *leucadendron* tall open shrubland over *Corchorus parviflorus* scattered low shrubs over *Triodia epactia* open hummock grassland with **Cenchrus ciliaris, *C. setiger* scattered tussock grasses.

Veg Condition Very Good: some weeds; evidence of cattle; some ground disturbance.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	15	MBU39-03	PLDK: sens. lat.
Acacia inaequilatera	3	400		
Alysicarpus muelleri	0.1	20	MBU39-17	
Amaranthus cuspidifolius	0.1	5	MBU39-04	
Aristida holathera var. *holathera*	0.1	35	MBU39-18	
Atalaya hemiglauca	0.1	150		
Boerhavia burbidgeana	0.1	15	MBU39-08	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia gardneri	0.1	20	MBU39-13	
Bonamia pilbarensis	0.1	3		
Bulbostylis barbata	0.1	10	MBU39-06	
**Cenchrus ciliaris*	1	35		NI=30
**Cenchrus setiger*	1	35		NI=50
Corchorus parviflorus	2	45	MBU09-03=	
Corchorus tridens	0.1	10	MBU39-10	
Corymbia hamersleyana	1	600		
Crotalaria medicaginea var. *neglecta*	0.1	25	MBU39-24	
Cucumis variabilis	0.1	90		
Cymbopogon ambiguus	0.1	80	MBU39-19	
Eriachne mucronata (typical form)	0.1	15	MBU39-14	
Euphorbia australis var. *subtomentosa*	0.1	2	MBU39-07	
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Fimbristylis dichotoma	0.1	25	MBU39-02	PLDK: sens. lat.; styles wholly ciliate.
Gomphrena cunninghamii	0.1	15		
Goodenia microptera	0.1	30		
Grevillea pyramidalis subsp. *leucadendron*	2	450		
Indigastrum parviflorum	0.1	25	MBU39-23	
Indigofera colutea	0.1	4		
Indigofera monophylla	0.1	120	MBU39-11	NI=5 at 120 cm; rest 40 cm.
Paspalidium clementii	0.1	10	MBU39-15	
Perotis rara	0.1	10	MBU39-20	
Polycarpaea corymbosa var. *corymbosa*	0.1	2	MBU39-01	
Polycarpaea holtzei	0.1	1		
Polygala glaucifolia	0.1	10	MBU39-22	
Portulaca oleracea/intraterranea	0.1	2	MBU39-05	PLDK: seeds faintly nippled.
Ptilotus clementii	0.1	20		
Rhynchosia minima	0.1	25		
Senna glutinosa subsp. *glutinosa*	0.1	45		
Sida echinocarpa	0.1	3	MBU39-21	
Solanum horridum	0.1	45	MBU39-16	
Solanum lasiophyllum	0.1	30	MBU39-25	
Sporobolus australasicus	0.1	3		
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	10	MBU39-12	
Tribulus hirsutus	0.1	15	MBU39-09	

Species	Cover	Height	Specimen	Notes
Trichodesma zeylanicum var. *zeylanicum*	0.1	3		
Triodia epactia	27	40	MBU19-01=	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU40

Described by RW,AL **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 192471 mE, 7557943 mN 120.020466°E, -22.056168°S

Habitat Gently sloping low hill (S-facing).

Soil Brown (7.5YR 4/3) light sandy clay loam.

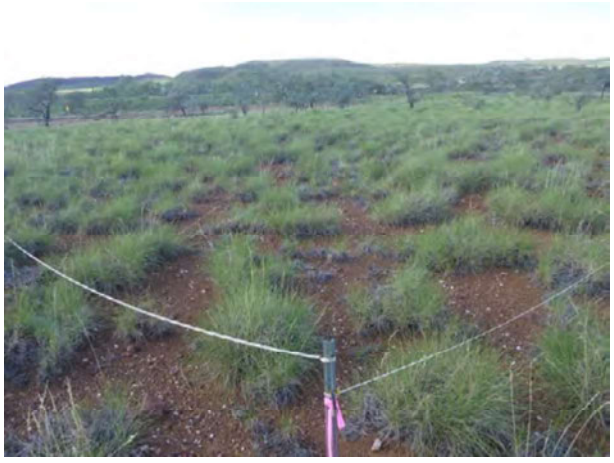
Rock Type Kylena Formation; basalt; mudstone.

Vegetation *Acacia inaequilatera,* (*Hakea lorea* subsp. *lorea*) scattered tall shrubs over *Triodia epactia* open hummock grassland.

Veg Condition Very Good: cattle and donkey scats; a few weeds, mainly **Cenchrus*.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	130		
Acacia inaequilatera	3	350		
**Aerva javanica*	0.1	4	MBU40-08	
Arivela viscosa	0.1	20		
Boerhavia coccinea	0.1	5	MBU40-10	Sens lat.
Bonamia pilbarensis	0.1	10	MBU40-13	
**Cenchrus ciliaris*	0.1	30		NI=50
**Cenchrus setiger*	0.1	40		NI=5
Corchorus parviflorus	0.1	25	MBU52-21=	
Corchorus tridens	0.1	2	MBU40-03	
Crotalaria medicaginea var. *neglecta*	0.1	3	MBU40-02	
Dactyloctenium radulans	0.1	2		
Enneapogon caerulescens	0.1	2	MBU40-16	
Euphorbia vaccaria var. *vaccaria*	0.1	1	MBU40-01	
Gomphrena cunninghamii	0.1	3	MBU40-14	
Gossypium australe	0.1	2		Burrup Peninsula form: greener indumentum.
Hakea lorea subsp. *lorea*	1	300	MBU40-07	PLDK: sens. lat.
Indigofera colutea	0.1	1		
Indigofera linifolia	0.1	15	MBU40-15	
Perotis rara	0.1	1		
Polygala glaucifolia	0.1	2	MBU40-06	
Portulaca oleracea/intraterranea	0.1	2		
Ptilotus auriculifolius	0.1	2	MBU40-05	
Rhynchosia minima	0.1	1		
Sida echinocarpa	0.1	20	MBU40-09	
Solanum lasiophyllum	0.1	15	MBU40-11	
Solanum sp.	0.1	3	MBU40-04	Inadequate material; seedling
Sporobolus australasicus	0.1	15		
Tribulus hirsutus	0.1	3	MBU40-12B	
Triodia epactia	23	35		
Triodia longiceps	0.1	40	MBU40-12A	



Marble Bar Rd Upgrade **Site** MBU41

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 35 x 65 m

MGA Zone 51 201624 mE, 7577388 mN 120.112610°E, -21.882306°S

Habitat Crest and upper slopes of a rounded low hill.

Soil Dark red (2.5YR 3/6) silty loam.

Rock Type Shale (poorly metamorphosed); mapped as ferruginous duricrust.

Vegetation *Acacia aphanoclada* scattered tall shrubs over *A. bivenosa* scattered shrubs over *Indigofera monophylla* scattered low shrubs over *Triodia epactia, (T. wiseana*) hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Small patch of *Triodia wiseana* (10 x 5 m) on very crest.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	60	MBU41-14	
Acacia adoxa var. *adoxa*	0.1	70	MBU41-06	
Acacia aphanoclada	0.1	450		N=5. Number not recorded; estimated. Recruitment noted.
Acacia aphanoclada x *pyrifolia* var. *pyrifolia*	0.1	12	MBU41-17	
Acacia bivenosa	0.1	200	MBU41-10	Bushy. PLDK: sens. lat.
Acacia hilliana	0.1	100	MBU41-01	Spreading shrub.
Acacia inaequilatera	0.1	200	MBU41-13	
Bonamia pilbarensis	0.1	5	MBU41-03	
Cassytha capillaris	0.1	40		Spreading to 1m across.
Corchorus parviflorus	0.1	20	MBU41-11	
Cymbopogon ambiguus	0.1	90	MBU41-04	
Eriachne mucronata (typical form)	0.1	40	MBU41-16	
Eucalyptus leucophloia subsp. *leucophloia*	0.1	400		
Goodenia cusackiana	0.1	25	MBU41-18	
Hibiscus coatesii	0.1	30	MBU41-02	Spindly.
Indigofera monophylla	0.1	45	MBU41-07	Greyish leaflets. PLDK: sens. lat.
Polygala glaucifolia	0.1	2	MBU41-05	
Ptilotus exaltatus	0.1	2		
Senna glutinosa subsp. *glutinosa*	0.1	220	MBU41-15	MET det.
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	110	MBU41-09	Very slightly sticky. MET det.
Senna symonii	0.1	30		
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	20	MBU41-12	Orange flowers.
Tribulus hirsutus	0.1	10	MBU41-19	
Triodia epactia	30	50	MBU41-20	PLDK: sens. lat.
Triodia wiseana	5	40	MBU41-08	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU42

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 201681 mE, 7575595 mN 120.112835°E, -21.898494°S

Habitat Plain, with slight SW-facing slope with very small drainage lines.

Soil Reddish brown (2.5YR 4/4) clay loam.

Rock Type N/A for quadrat; Mosquito Creek Formation, located near shale outcrop.

Vegetation *Acacia bivenosa* scattered shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Very Good: cattle scats, tracks; road drain at S edge of quadrat.

Fire Age No sign of recent fire.

Notes Patches of *Acacia bivenosa* in slight flow areas.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.5	200	MBU42-10	PLDK: sens. lat.
Acacia synchronicia	0.1	70	MBU42-13	
Chrysopogon fallax	0.1	85	MBU42-17	1 plant.
Cynodon prostratus	0.1	5	MBU42-07	
Dactyloctenium radulans	0.1	7		
Eucalyptus leucophloia subsp. *leucophloia*	0.1	220		Overhanging; rooted just outside quadrat.
Fimbristylis dichotoma	0.1	20	MBU42-16	PLDK: sens. lat.; style ciliate in upper portion.
Hibiscus coatesii	0.1	80	MBU42-03	
Hibiscus sturtii var. *grandiflorus*	0.1	30	MBU42-04	
Indigofera monophylla	0.1	140	MBU42-11	In slight flow area.
Maireana ? eriosphaera	0.1	60	MBU42-09	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Pluchea ferdinandi-muelleri	0.1	50	MBU42-01	
Portulaca oleracea/intraterranea	0.1	2		
Sclerolaena cuneata	0.1	15	MBU42-08, -14	
Sclerolaena hostilis	0.1	50	MBU42-15	
Senna symonii	0.1	120		
Sida fibulifera	0.1	15	MBU42-05	PLDK: sens. lat.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	0.1	70	MBU42-12	Number not recorded, entered as N=1. PLDK: matches MBU69-33.
Sporobolus australasicus	0.1	10		
Trianthema triquetrum	0.1	10	MBU42-06	
Triodia longiceps	70	120	MBU42-02	



Marble Bar Rd Upgrade **Site** MBU43

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 201178 mE, 7571751 mN 120.107270°E, -21.933093°S

Habitat Gentle NW-facing slopes below a low ridge.

Soil Brown (7.5YR 5/4) silty clay.

Rock Type Mosquito Creek Formation; shale, quartz.

Vegetation *Melaleuca eleuterostachya* scattered shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Very Good: 1 corner slightly disturbed; cattle scats and tracks present.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	220		
Acacia bivenosa	0.1	300	MBU42-10=	PLDK: sens. lat.
Acacia trachycarpa	0.1	350		
Cassytha capillaris	0.1	30		
**Cenchrus ciliaris*	0.1	50		In disturbed area.
Corymbia hamersleyana	0.1	450	MBU43-01	Two small erect trees. 'Sens. lat.'
Dodonaea lanceolata var. *lanceolata*	0.1	170	MBU43-04	
Melaleuca eleuterostachya	2	190	MBU43-02	
Pluchea ferdinandi-muelleri	0.1	80		
Pluchea tetranthera	0.1	60		
Ptilotus exaltatus	0.1	15		
Santalum lanceolatum	0.1	70	MBU43-05	NI=5. Juvenile.
Senna symonii	0.1	130		
Sporobolus actinocladus	0.1	25		
Sporobolus australasicus	0.1	10		
Trianthema triquetrum	0.1	5	MBU43-03	
Triodia longiceps	55	120	MBU42-02=	



Marble Bar Rd Upgrade **Site** MBU44
Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 201007 mE, 7570017 mN 120.105300°E, -21.948710°S
Habitat Moderate W-facing slope of a low ridge; very rocky.
Soil Dark red (2.5YR 3/6) sandy clay loam.
Rock Type Rocky: Mount Roe Basalt; dolerite.
Vegetation *Acacia inaequilatera* tall open shrubland over *Triodia epactia* hummock grassland.
Veg Condition Excellent.
Fire Age No sign of recent fire.
Notes See sketch of quadrat for detailed layout.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	90	MBU44-20	Fls yellow.
Acacia inaequilatera	7	350	MBU44-03	
Alysicarpus muelleri	0.1	30	MBU44-11B	
Amaranthus undulatus	0.1	40	MBU44-26	
Arivela viscosa	0.1	15	MBU44-08	
Boerhavia burbidgeana	0.1	15	MBU44-16	PLDK: indumentum atypical; some type 2 hairs on older stems.
Bonamia pilbarensis	0.1	30	MBU44-11A	
Bulbostylis barbata	0.1	10	MBU44-18B	
**Cenchrus ciliaris*	0.1	60		A few plants; 2 forms, typical and long-bristled.
Corchorus parviflorus	0.1	30	MBU44-07	Juvenile.
Cucumis variabilis	0.1	50	MBU44-09	Juvenile.
Dysphania rhadinostachya	0.1	40		Juvenile, sterile; subsp. not determined.
Eremophila longifolia	0.1	60	MBU44-20	
Euphorbia australis var. *subtomentosa*	0.1	12	MBU44-05, -18A	
Euphorbia boophthona	0.1	25	MBU44-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	20	MBU44-25	
Gomphrena cunninghamii	0.1	10	MBU44-21	
Gossypium australe	0.1	130		Whim Creek form: greyer indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	220		Juvenile.
Hybanthus aurantiacus	0.1	10	MBU44-13	PLDK: sens. lat.
Indigofera colutea	0.1	5		
Paspalidium clementii	0.1	35	MBU44-24	
Polycarpaea corymbosa var. *corymbosa*	0.1	8		
Polycarpaea holtzei	0.1	5	MBU44-23	Flowers white.
Polycarpaea longiflora	0.1	25	MBU44-17	
Portulaca oleracea/intraterranea	0.1	10	MBU44-06	PLDK: seeds faintly nippled.
Ptilotus auriculifolius	0.1	20		
Rhynchosia minima	0.1	25	MBU44-04	
Senna glutinosa subsp. *glutinosa*	0.1	90	MBU44-27	
Sida echinocarpa	0.1	45	MBU44-22	
Solanum horridum	0.1	5	MBU44-15	Juvenile.
Sporobolus australasicus	0.1	15		
Streptoglossa decurrens	0.1	5	MBU44-19	
Tephrosia densa	0.1	90	MBU44-01	
Tribulus hirsutus	0.1	10	MBU44-10	
Trichodesma zeylanicum var. *zeylanicum*	0.1	20	MBU44-12	
Triodia epactia	60	50	MBU44-02	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU45

Described by SC **Date** 08-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 201601 mE, 7572378 mN 120.111476°E, -21.927507°S

Habitat Rocky boulder low hill.

Soil Reddish brown clay loam.

Rock Type Rocky: Mount Roe Basalt; dolerite.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Senna artemisioides* subsp. *oligophylla* scattered low shrubs over *Triodia wiseana* hummock grassland.

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

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	180		
Acacia inaequilatera	0.5	400		
Aristida contorta	0.1	5		
Arivela viscosa	0.1	5		
Boerhavia coccinea	0.1	10	MBU45-03	Sens lat.
**Cenchrus ciliaris*	0.1	30		NI=30.
Corchorus sp.	0.1	5		Sterile. Juvenile.
Crotalaria medicaginea var. *neglecta*	0.1	10		
Cucumis variabilis	0.1	20		Typical form.
Cymbopogon ambiguus	0.1	70	MBU45-09	
Enneapogon caerulescens	0.1	15	MBU45-05	
Euphorbia careyi	0.1	30	MBU45-11	
Gomphrena cunninghamii	0.1	5	MBU25-04=	
Gossypium australe	0.1	50	MBU45-12	Whim Creek form: greyer indumentum.
Indigofera monophylla	0.1	60	MBU45-08	PLDK: sens. lat.
Notoleptopus decaisnei	0.1	10		
Paspalidium clementii	0.1	10	MBU45-06	
Ptilotus clementii	0.1	5	MBU45-14	
Rhagodia eremaea	0.1	50	MBU45-07	
Rhynchosia minima	0.1	20		
Senna artemisioides subsp. *helmsii*	0.1	20		
Senna artemisioides subsp. *oligophylla*	0.5	60	MBU45-04	
Senna glutinosa subsp. *glutinosa*	0.1	70		
Solanum sp.	0.1	5		Sterile, juvenile.
Sporobolus australasicus	0.1	5		
Themeda triandra	0.1	30		
Trachymene oleracea subsp. *oleracea*	0.1	10	MBU45-13	
Tribulus hirsutus	0.1	5	MBU45-02	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		Tiny. Sterile.
Triodia wiseana	40	40	MBU45-01A	PLDK: sens. lat.; long lemma lobe form.
Triumfetta appendiculata	0.1	20	MBU45-10	



Marble Bar Rd Upgrade **Site** MBU46

Described by RM,SC **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 192950 mE, 7558250 mN 120.025160°E, -22.053483°S

Habitat Plain; mosaic of stony soil and patches of cracking clay.

Soil Reddish brown clay loam; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Acacia synchronicia* open shrubland over *Senna hamersleyensis* x *S.* sp. Karijini (M.E. Trudgen 10392) scattered low shrubs over *Triodia longiceps, T. epactia* open hummock grassland over *Neptunia dimorphantha* open herbland with *Sporobolus australasicus* very open annual grassland.

Veg Condition Very Good: small amount of **Cenchrus* spp. and **Aerva*; cattle scats.

Fire Age Burnt 3-5 years ago.

Notes Typical clay spp. present.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	15	MBU46-19	
Acacia synchronicia	3	150		
**Aerva javanica*	0.1	30		NI=1.
Alysicarpus muelleri	0.1	20	MBU15-01=	
Aristida latifolia	0.1	30	MBU46-28	
Arivela viscosa	0.1	20		
Boerhavia coccinea	0.1	15	MBU45-03=	Sens lat.
Bulbostylis turbinata	0.1	5	MBU46-27	
**Cenchrus ciliaris*	0.1	30		NI=100
**Cenchrus setiger*	0.1	30		
Chloris pectinata	0.1	10	MBU46-06	
Corchorus tridens	0.1	5	REL12-15=	
Crotalaria medicaginea var. *neglecta*	0.1	10		
Cullen graveolens	0.1	10	MBU46-14	On clay.
Cynodon convergens	0.1	5	MBU46-07	PLDK: spike length intermediate between taxa. Det confirmed by M Hislop (WAH).
Dactyloctenium radulans	0.1	5		
Desmodium campylocaulon	0.1	10	MBU46-20	
Desmodium muelleri	0.1	20	MBU46-21	
Dichanthium sericeum subsp. *humilius*	0.1	20		
Enneapogon caerulescens	0.1	20	MBU46-29	
Eragrostis leptocarpa	0.1	60	MBU46-10	
Eragrostis tenellula	0.1	10	MBU46-11	
Eriachne mucronata (typical form)	0.1	20	MBU46-24	
Eriachne pulchella	0.1	5		
Euphorbia inappendiculata var. *inappendiculata*	0.1	5	MBU46-12	Det confirmed by M Hislop (WAH).
Euphorbia trigonosperma	0.1	15	MBU46-23	
Evolvulus alsinoides var. *villosicalyx*	0.1	5		
Goodenia muelleriana	0.1	20	MBU46-22	Sens. lat.
Hibiscus brachysiphonius	0.1	10	SC27=	Prostrate.
Ipomoea muelleri	0.1	20	REL08-04=	
Neptunia dimorphantha	25	5	MBU46-01	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU46-13	
Phyllanthus maderaspatensis	0.1	10	MBU46-17	
Portulaca oleracea/intraterranea	0.1	5		
Ptilotus gomphrenoides	0.1	10	MBU46-18	PLDK: sens. lat.
Rhynchosia minima	0.1	5		
Rostellularia adscendens var. *clementii*	0.1	5	MBU46-15	
Sclerolaena cornishiana	0.1	25	MBU46-25	
Sclerolaena costata	0.1	10	MBU46-26	
Senna glutinosa subsp. *x luerssenii*	0.1	30		
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.5	10	MBU46-03	MET det.
Sida fibulifera	0.1	10	MBU46-08	PLDK: sens. lat.

Species	Cover	Height	Specimen	Notes
Sporobolus australasicus	9	5		
Streptoglossa liatroides	0.1	10	MBU46-09	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	5	MBU46-30	On clay.
Trianthema triquetrum	0.1	10		
Tribulus hirsutus	0.1	10		
Triodia epactia	10	40	MBU46-16	
Triodia longiceps	10	60		



Marble Bar Rd Upgrade **Site** MBU47

Described by AL,BRM **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 804732 mE, 7547791 mN 119.954371°E, -22.148254°S

Habitat Floodplain adjacent to creek.

Soil Reddish brown (2.5YR 4/4) loam.

Rock Type N/A.

Vegetation *Corymbia hamersleyana* low open woodland over **Vachellia farnesiana, Acacia trachycarpa* tall open shrubland over **Cenchrus ciliaris,* (**C. setiger*) open tussock grassland over *Boerhavia coccinea, Indigofera linnaei, Boerhavia burbidgeana* very open herbland.

Veg Condition Good: small amount of **Cenchrus* cover and other weeds present; signs of recent cattle activity (scat, tracks, grazing).

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	0.1	15	MBU47-45	PLDK: atypical. Det by M Hislop (WAH).
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	110	MBU47-09	PLDK: sens. lat.
Acacia pyrifolia var. *pyrifolia*	0.1	180		
Acacia tetragonophylla	0.1	210		
Acacia trachycarpa	1	400		
**Aerva javanica*	0.1	45		NI=4
Alternanthera nana	0.1	15		
Alysicarpus muelleri	0.1	55	MBU47-34	
Amaranthus undulatus	0.1	40	MBU17-05=	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	0.1	160		
Boerhavia burbidgeana	2	20	MBU47-21	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	5	15	MBU47-20	Sens. lat.
Boerhavia coccinea	0.1	10	MBU47-48	Compound fruits. Sens lat.
**Cenchrus ciliaris*	25	45		
**Cenchrus ciliaris*	0.1	20	MBU47-43	Longer bristled form.
**Cenchrus setiger*	4	40		
Chrysopogon fallax	0.1	90		
**Citrullus colocynthis*	0.1	20	MBU47-51	Tennis-ball sized fruit.
Corchorus parviflorus	0.1	40	MBU47-24	
Corchorus tridens	0.1	30	MBU47-02	
Corymbia hamersleyana	7	550	MBU47-01	Sens. lat.
Crotalaria medicaginea var. *neglecta*	0.1	35		
Cucumis melo	0.1	10		
Cucumis variabilis	0.1	20		
Cullen leucanthum	0.1	70	MBU47-11	
Cynodon convergens	0.1	20	MBU47-42	
Cyperus vaginatus	0.5	40		
Dactyloctenium radulans	0.1	10		
Duperreya commixta	0.1	60		
Dysphania rhadinostachya	0.1	25		
Enneapogon caerulescens	0.1	20	MBU47-18	
Enneapogon polyphyllus	0.1	20	MBU47-16	PLDK: sens. lat.
**Eragrostis cilianensis*	0.1	20	MBU47-04, 47	Det confirmed by M Hislop (WAH).
Eremophila longifolia	0.1	100	MBU47-23	
Euphorbia australis var. *subtomentosa*	0.1	10	MBU47-52	
Euphorbia biconvexa	0.1	15	MBU47-03	
Evolvulus alsinoides var. *decumbens*	0.1	35	MBU47-17	
Evolvulus alsinoides var. *villosicalyx*	0.1	15	Sterile.	
Glycine canescens	0.1	60	MBU47-37	
Goodenia forrestii	0.5	20	MBU47-27	Sens. lat.
Goodenia microptera	0.1	25	MBU47-25	
Goodenia nuda	0.1	40	MBU47-07	
Hakea lorea subsp. *lorea*	0.1	350		

Species	Cover	Height	Specimen	Notes
Hibiscus coatesii	0.1	40	MBU47-14	Pale mauve flowers.
Hibiscus sturtii var. *platychlamys*	0.1	40	MBU47-29	
Hybanthus aurantiacus	0.1	30		
Indigofera colutea	0.1	15		
Indigofera linifolia	0.1	20	MBU47-35, 53	
Indigofera linnaei	3	20	MBU47-36	
Indigofera trita subsp. *trita*	0.1	25	MBU47-38	
Ipomoea polymorpha	0.1	20	MBU47-46	
**Malvastrum americanum*	0.1	40		
Notoleptopus decaisnei	0.1	25	MBU47-41	
Perotis rara	0.1	15		
Polygala glaucifolia	0.1	5	MBU47-44	Purple flowers.
Portulaca oleracea/intraterranea	0.1	10		
Ptilotus auriculifolius	0.1	30		
Rhynchosia minima	0.1	15	MBU47-26	
Scaevola amblyanthera var. *centralis*	0.1	15	MBU47-05	PLDK: sens. lat.
Senna notabilis	0.1	40		
Sesbania cannabina	0.1	10		
Sida echinocarpa	0.1	40	MBU47-30, 31	
Sida fibulifera	0.1	25	MBU47-39	PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	30	MBU47-32	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	25	MBU47-13	Ferruginous form.
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	50	MBU47-33	
Solanum diversiflorum	0.1	20		
Solanum horridum	0.1	15	MBU47-22	
Solanum phlomoides	0.1	40	MBU47-10	
Sporobolus australasicus	0.1	20	MBU47-19	
Swainsona stenodonta	0.1	20	MBU47-54	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	40	MBU47-08, 50	PLDK: atypical indumentum R. Butcher.
Themeda triandra	0.1	70		
Trianthema triquetrum	0.1	10	MBU47-49	
Tribulus hirsutus	0.1	15		
Tribulus platypterus	0.1	50	MBU47-12	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	15	MBU47-40	PLDK: matches MBU54-41; larger flowers and long pedicel.
Triodia epactia	0.1	40		Resinous, sterile.
Triodia longiceps	0.1	25	MBU47-28	
**Vachellia farnesiana*	1.5	300		
Zaleya galericulata subsp. *galericulata*	0.1	15	MBU47-15	Prostrate herb, white flowers.



Marble Bar Rd Upgrade **Site** MBU48

Described by AL,BRM **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803321 mE, 7545259 mN 119.941180°E, -22.171346°S

Habitat Gentle slope; E-facing.

Soil Reddish brown loam.

Rock Type Basalt.

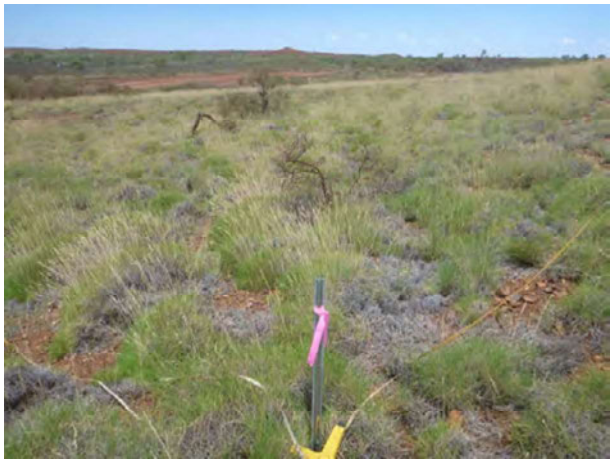
Vegetation *Acacia bivenosa* scattered shrubs over *A. synchronicia* scattered low shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Excellent to Very Good: cattle scat; slight disturbance in NE corner.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.5	120		
Acacia inaequilatera	0.1	190		
Acacia synchronicia	0.3	90		
Alysicarpus muelleri	0.1	30	MBU48-20	
Arivela viscosa	0.1	40		
Boerhavia coccinea	0.1	25	MBU48-13	Sens lat.
Bonamia pilbarensis	0.1	5	MBU48-18	
**Cenchrus setiger*	0.1	45		NI=4
Corchorus parviflorus	0.1	35	MBU48-28A	
Corchorus tridens	0.1	5	MBU47-02=	
Crotalaria medicaginea var. *neglecta*	0.1	35		
Cucumis variabilis	0.1	90		
Cymbopogon sp.	0.1	30		Sterile.
Dactyloctenium radulans	0.1	20		
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU47-18=	
Enneapogon polyphyllus	0.1	30	MBU48-16	PLDK: sens. lat.
Eremophila latrobei subsp. *latrobei*	0.1	60	MBU48-32	
Eriachne pulchella	0.1	15	MBU48-10	Sens lat.
Euphorbia australis var. *subtomentosa*	0.1	3	MBU48-12	
Euphorbia biconvexa	0.1	20	MBU48-06	
Evolvulus alsinoides var. *villosicalyx*	0.1	15		
Gomphrena cunninghamii	0.1	5		
Goodenia muelleriana	0.1	30	MBU48-07	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	300		
Indigastrum parviflorum	0.1	30	MBU48-24	
Indigofera trita subsp. *trita*	0.1	20	MBU48-02	Orange flowers.
Iseilema dolichotrichum	0.1	12	MBU48-04	
Maireana georgei	0.1	15	MBU48-27A, -29	PLDK: sens. lat.
Maireana melanocoma	0.1	30	MBU48-09	
Paspalidium clementii	0.1	20	MBU48-21	
Polygala glaucifolia	0.1	5	MBU48-03	
Portulaca oleracea/intraterranea	0.1	2	MBU48-26a	PLDK: seeds faintly nippled.
Ptilotus aervoides	0.1	3	MBU48-11	
Ptilotus auriculifolius	0.1	45		
Rhynchosia minima	0.1	35	MBU48-23	
Sclerolaena costata	0.1	20	MBU48-26b, -27B, -30	
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	90	MBU48-28B	MET det.; a backcross with *S. glutinosa*.
Senna notabilis	0.1	5		
Sida echinocarpa	0.1	10	MBU48-31	
Sida fibulifera	0.1	30	MBU48-25	PLDK: sens. lat.
Solanum horridum	0.1	15	MBU47-22=	
Sporobolus australasicus	0.1	25		
Streptoglossa bubakii	0.1	15	MBU48-05, 19	
Swainsona stenodonta	0.1	20	MBU48-15	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	30	MBU48-14, 22	
Trianthema triquetrum	0.1	5		

Species	Cover	Height	Specimen	Notes
Tribulus hirsutus	0.1	10		
Triodia longiceps	0.1	110	MBU48-08	
Triodia wiseana	40	90	MBU48-01	PLDK: sens. lat.; long lemma lobe form.
Vincetoxicum lineare	0.1	30		



Marble Bar Rd Upgrade **Site** MBU49

Described by AL,BRM **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 802622 mE, 7543738 mN 119.934694°E, -22.185191°S

Habitat Gentle E-facing lower slope.

Soil Reddish brown clay loam.

Rock Type Ferruginous colluvium; chert, ironstone, mudstone, calcrete, quartz.

Vegetation *Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Triodia wiseana,* (*T. longiceps*) open hummock grassland.

Veg Condition Excellent: cattle scat, tracks; donkey scat.

Fire Age No sign of recent fire.

Notes *Eucalyptus xerothermica* occurs just outside quadrat.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	10	MBU49-09	
Alysicarpus muelleri	0.1	40	MBU48-20=	
Arivela viscosa	0.1	20		
Capparis umbonata	0.1	45		Grazed.
**Cenchrus setiger*	0.1	25		
Corchorus tridens	0.1	3	MBU49-25	
Cucumis variabilis	0.1	10		
Dactyloctenium radulans	0.1	3		
Dysphania sphaerosperma	0.1	10	MBU49-05	
Enneapogon caerulescens	0.1	20	MBU47-18=	
Enneapogon polyphyllus	0.1	20	MBU48-16=	PLDK: sens. lat.
Eragrostis desertorum	0.1	45	MBU49-18	
Eucalyptus socialis subsp. *eucentrica*	4	400	MBU49-13, 16	Mallee. Hemispherical cap. Urn-shaped fruit. Socks to 1m, smooth bark above orangey-grey.
Euphorbia biconvexa	0.1	25	MBU49-03	
Euphorbia vaccaria var. *erucoides*	0.1	5	MBU49-08	
Evolvulus alsinoides	0.1	20		
Goodenia microptera	0.1	15	MBU49-24	Hairy leaves.
Goodenia muelleriana	0.1	15	MBU48-07=	Sens. lat.
Heliotropium chrysocarpum	0.1	30	MBU49-07	
Indigofera linifolia	0.1	25	MBU49-26	
Indigofera linnaei	0.1	10		
Indigofera monophylla	0.1	15		
Iseilema dolichotrichum	0.1	15	MBU48-04=	
Notoleptopus decaisnei	0.1	10	MBU49-02	
Paraneurachne muelleri	0.1	30		
Paspalidium clementii	0.1	15	MBU49-17	
Perotis rara	0.1	12		
Phyllanthus maderaspatensis	0.1	10		
Polygala glaucifolia	0.1	10	MBU49-04	
Ptilotus axillaris	0.1	5		
Ptilotus clementii	0.1	10		
Ptilotus exaltatus	0.1	5		
Sclerolaena cornishiana	0.1	20	MBU49-15	
Sclerolaena costata	0.1	20	MBU49-06	
Senna glutinosa subsp. *glutinosa*	0.1	120		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	130	MBU49-20	Not sticky. MET det.
Senna notabilis	0.1	10		
Senna symonii	0.1	35	MBU49-22	
Sida echinocarpa	0.1	10	MBU49-11	Grey leaves.
Sida fibulifera	0.1	10	MBU49-23	PLDK: sens. lat.
Solanum horridum	0.1	10		
Solanum lasiophyllum	0.1	25		Grey leaves.
Sporobolus australasicus	0.1	10		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	20	MBU49-01	
Streptoglossa bubakii	0.1	20	MBU48-05=	
Streptoglossa decurrens	0.1	20	MBU49-21	

Species	Cover	Height	Specimen	Notes
Tribulus hirsutus	0.1	10		
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		
Triodia longiceps	7	70		
Triodia wiseana	15	60	MBU48-01=	PLDK: sens. lat.; long lemma lobe form.
Vincetoxicum lineare	0.1	200		



Marble Bar Rd Upgrade **Site** MBU50

Described by AL,BRM **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 802336 mE, 7540462 mN 119.932538°E, -22.214799°S

Habitat Gently sloping E-facing undulating rise, upslope of drainage line.

Soil Brown (7.5YR 4/3) loam.

Rock Type Calcrete, ironstone, mudstone.

Vegetation *Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Acacia bivenosa* tall open shrubland over *Triodia wiseana,* (*T. longiceps*) hummock grassland.

Veg Condition Very Good: cattle scat, tracks; donkey scats; pockets of **Cenchrus*.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon cunninghamii	0.1	80	MBU50-13	Amongst mallee.
Acacia bivenosa	3	250		
Acacia coriacea subsp. *pendens*	0.1	190	MBU50-24	Long narrow phyllodes.
Arivela viscosa	0.1	40		
Capparis umbonata	0.1	90		
**Cenchrus ciliaris*	0.1	40		NI=50.
Chrysopogon fallax	0.1	100		
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	30	MBU50-25	
Corchorus tridens	0.1	10	MBU50-06	
Cucumis variabilis	0.1	20		
Dysphania sphaerosperma	0.1	10	MBU50-21	
Enneapogon cylindricus	0.1	10	MBU50-14	
Enneapogon polyphyllus	0.1	20	MBU50-20	PLDK: sens. lat.
Eragrostis desertorum	0.1	60	MBU50-16, -32	
Eremophila longifolia	0.1	70	MBU50-17	Sterile. NI=4.
Eucalyptus socialis subsp. *eucentrica*	7	450	MBU50-08	Mallee; horned buds, socks to 1m, light grey-salmon bark above.
Euphorbia vaccaria var. *erucoides*	0.1	5	MBU50-05	
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Goodenia microptera	0.1	5	MBU50-30	
Heliotropium chrysocarpum	0.1	25	MBU50-04	
Heliotropium cunninghamii	0.1	15	MBU50-15	
Hibiscus coatesii	0.1	25	MBU50-12	
Hibiscus sturtii var. *campylochlamys*	0.1	20	MBU50-27	
Indigofera monophylla	0.1	120	MBU50-29	
Notoleptopus decaisnei	0.1	20		
Paraneurachne muelleri	0.1	30		
Pluchea ferdinandi-muelleri	0.1	50	MBU50-11	
Polygala glaucifolia	0.1	3	MBU49-04=	
Ptilotus clementii	0.1	10	MBU50-23	
Ptilotus exaltatus	0.1	40		
Scaevola amblyanthera var. *centralis*	0.1	30	MBU50-28	PLDK: sens. lat.
Scaevola spinescens	0.1	60	MBU50-02	
Sclerolaena cornishiana	0.1	20	MBU50-18	
Senna notabilis	0.1	5		
Senna symonii	0.1	110	MBU50-10, 19, 26	
Sida echinocarpa	0.1	25	MBU50-31	
Sida fibulifera	0.1	10	MBU50-22	PLDK: sens. lat.
Solanum horridum	0.1	10	MBU50-33	
Sporobolus australasicus	0.1	20		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	10	MBU49-01=	
Streptoglossa bubakii	0.1	5	MBU48-05=	
Streptoglossa decurrens	0.1	5	MBU49-21=	
Tephrosia clementii	0.1	15	MBU50-09	
Themeda ? sp. Hamersley Station (M.E. Trudgen 11431)	0.1	70	MBU50-07	Poor material.
Tribulus hirsutus	0.1	5		
Triodia longiceps	2.5	80	MBU50-03	

Species	Cover	Height	Specimen	Notes
Triodia wiseana	40	60	MBU50-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU51

Described by RW,AL **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 809040 mE, 7554459 mN 119.994822°E, -22.087334°S

Habitat Major creek bed with islands.

Soil Yellowish red alluvial sand.

Rock Type Mudstone.

Vegetation *Eucalyptus victrix* woodland over *Acacia coriacea* subsp. *pendens,* (*Atalaya hemiglauca*) low woodland over *Melaleuca glomerata* tall shrubland over **Cenchrus setiger* , (**Echinochloa colona*) open tussock grassland.

Veg Condition Good to Poor: moderate **Cenchrus* cover and other weeds present; light grazing by cattle.

Fire Age No sign of recent fire.

Notes Small pools of water in creek bed.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	130		
Acacia coriacea subsp. *pendens*	15	600		
Alternanthera denticulata	0.1	25	MBU51-10	
Alysicarpus muelleri	0.1	20	MBU51-46	
Amaranthus undulatus	0.1	90	MBU51-33	
Ammannia multiflora	0.1	25	MBU51-38, -47	Herb, in wet area.
Arivela viscosa	0.1	40		
Atalaya hemiglauca	2	130		
Boerhavia coccinea	0.1	20	MBU51-41	Sens lat.
Bulbostylis barbata	0.1	5	MBU51-06	
Calandrinia tepperiana	1	20	MBU51-08	Pink and white flowers. PLDK: petals <7; matches MBU30-55.
**Cenchrus ciliaris*	0.1	45		NI=10
**Cenchrus setiger*	20	120		NI=1000
Centipeda minima subsp. *macrocephala*	0.1	5	MBU51-32	
Chara sp.	0.1	20	MBU51-49	Aquatic algae. In water pool.
**Citrullus colocynthis*	0.1	45	MBU51-43	NI=5.
Corchorus parviflorus	0.1	35	MBU51-11	
Corchorus tridens	0.1	20	MBU51-20	
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	35		
Cyperus difformis	0.1	40	MBU51-15	
Cyperus iria	0.1	25	MBU51-05	
Cyperus ixiocarpus	0.1	40	MBU51-37	
Cyperus squarrosus	0.1	20	MBU51-01	
Cyperus vaginatus	0.1	35		
Dactyloctenium radulans	0.1	2		
**Echinochloa colona*	1	25	MBU51-25	
Eragrostis crateriformis	0.1	35	MBU51-04	PLDK: matches MBU54-46.
Eragrostis cumingii	0.1	35	MBU51-03	
Eucalyptus victrix	20	1400	MBU51-14	
Eulalia aurea	0.1	80	MBU51-27	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	2	MBU51-31	
**Euphorbia hirta*	0.1	20	MBU51-30	
Euphorbia trigonosperma	0.1	30	MBU51-22	
Fimbristylis depauperata	0.1	20	MBU51-07	
Goodenia lamprosperma	0.1	35	MBU51-29	
Hybanthus aurantiacus	0.1	20	MBU51-36	PLDK: sens. lat.
Ipomoea muelleri	0.1	25	MBU51-26	
Ipomoea polymorpha	0.1	20	MBU51-45	
Ipomoea racemigera	0.1	35	MBU51-42	
Lipocarpha microcephala	0.1	25	MBU51-28	
Ludwigia perennis	0.1	25	MBU51-39	Herb.
**Malvastrum americanum*	0.1	40		NI=2
Marsilea hirsuta	0.1	2	MBU51-48	
Melaleuca glomerata	12	250	MBU51-34	White paperbark strips.
Melaleuca linophylla	0.1	140	MBU51-35	Papery bark, creamy brown.
Notoleptopus decaisnei	0.1	10	MBU51-09	

Species	Cover	Height	Specimen	Notes
Phyllanthus maderaspatensis	0.1	25		
**Physalis angulata*	0.1	30	MBU51-17	
Pluchea dentex	0.1	5	MBU51-18	
Pluchea rubelliflora	0.1	10	MBU51-23	
Plumbago zeylanica	0.1	25	MBU51-19	NI=1.
Portulaca intraterranea	0.1	20	MBU51-16	Det confirmed by M Hislop (WAH): all identifications in the *P. oleracea* complex are tentative pending much-needed revision of this difficult group.
Pterocaulon sphacelatum	0.1	2	MBU51-40	Juvenile.
Rostellularia adscendens var. *clementii*	0.1	25	MBU51-13	
Sesbania cannabina	0.1	30		
Solanum horridum	0.1	3	MBU51-50	
Sporobolus australasicus	0.1	20	MBU51-02	
Stemodia grossa	0.1	15	MBU51-21	
Triodia longiceps	0.1	30	MBU51-12	
**Vachellia farnesiana*	0.1	110		NI=1
Vigna lanceolata var. *lanceolata*	0.1	30	MBU51-24	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	35	MBU51-44	



Marble Bar Rd Upgrade **Site** MBU52

Described by RW,AL **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 806472 mE, 7550993 mN 119.970617°E, -22.119059°S

Habitat Valley between two small hills; E-facing slope.

Soil Red (2.5YR 4/6) clay loam.

Rock Type Basalt, mudstone.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia* var. *pyrifolia, A. inaequilatera* scattered tall shrubs over *Indigofera trita* subsp. *trita* scattered low shrubs over *Triodia longiceps*, (*T. epactia*) hummock grassland.

Veg Condition Very Good: cattle scats, tracks; small old track cutting through N side of quadrat.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	1	205		
Acacia pyrifolia var. *pyrifolia*	1	250	MBU52-14, -15	
Aeschynomene indica	0.1	35		
Arivela viscosa	0.1	20		
Bonamia pilbarensis	0.1	5	MBU52-25	
**Cenchrus ciliaris*	0.1	30		NI=1.
**Cenchrus setiger*	0.1	35		NI=30.
Corchorus parviflorus	0.1	35	MBU52-21	
Corchorus tridens	0.1	5	MBU52-09	
Corymbia hamersleyana	1	650		
Crotalaria medicaginea var. *neglecta*	0.1	25		
Cucumis picrocarpus	0.1	5	MBU52-28	NI=1.
Cucumis variabilis	0.1	20		
Desmodium campylocaulon	0.1	30	MBU52-08, -27	
Dichanthium sericeum subsp. *humilius*	0.1	10	MBU52-20	
Enneapogon caerulescens	0.1	20	MBU52-03	
Eriachne mucronata (typical form)	0.1	35	MBU52-05	
Euphorbia australis var. *subtomentosa*	0.1	5	MBU52-10	
Euphorbia trigonosperma	0.1	35	MBU52-06	
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Goodenia microptera	0.1	30	MBU52-04	
Goodenia muelleriana	0.1	15	MBU52-18	Sens. lat.
Heliotropium cunninghamii	0.1	30	MBU52-07	
Hibiscus sturtii var. *platychlamys*	0.1	25	MBU52-26	
Indigofera linifolia	0.1	10	MBU52-29	
Indigofera trita subsp. *trita*	1	50	MBU52-02	
Ipomoea polymorpha	1	5	MBU52-32	
Iseilema dolichotrichum	0.1	5	MBU52-16	
Neptunia dimorphantha	0.1	20	MBU52-13	
Notoleptopus decaisnei	0.1	10	MBU52-23	
Operculina aequisepala	0.1	25	MBU52-19	
Phyllanthus maderaspatensis	0.1	10		
Polygala glaucifolia	0.1	2	MBU52-1,22	
Portulaca oleracea/intraterranea	0.1	15		
Rhynchosia minima	0.1	50		
Sclerolaena costata	0.1	30	MBU52-24	
Sida fibulifera	0.1	20	MBU52-12, -31	PLDK: sens. lat.
**Sigesbeckia orientalis*	0.1	5		NI=1.
Sporobolus australasicus	0.1	20		
Stemodia grossa	0.1	1		
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	25	MBU52-30	
Triodia epactia	10	40	MBU52-17	PLDK: sens. lat.
Triodia longiceps	25	120	MBU50-03=	
**Vachellia farnesiana*	0.1	130		NI=3 (1A, 2 J).
Waltheria indica	0.1	5	MBU52-11	



Marble Bar Rd Upgrade **Site** MBU53
Described by RM,MET **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 50 804111 mE, 7546556 mN 119.948589°E, -22.159506°S
Habitat Plain; sloping gently to E.
Soil Reddish brown sandy clay loam.
Rock Type Basalt, quartz.
Vegetation *Acacia inaequilatera* scattered shrubs over *Triodia wiseana* hummock grassland.
Veg Condition Excellent.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	0.1	10	MBU53-07	PLDK: atypical. Det confirmed by M Hislop (WAH).
Acacia inaequilatera	0.5	170		
Acacia synchronicia	0.1	150	MBU53-15	PLDK: sens. lat.
**Aerva javanica*	0.1	15		NI=1
Alysicarpus muelleri	0.1	25	MBU53-16	
Aristida contorta	0.1	25		
Arivela viscosa	0.1	30	MBU53-13	
Boerhavia coccinea	0.1	25	MBU53-12	Sens lat.
Bonamia pilbarensis	0.1	20	MBU53-10	
**Cenchrus ciliaris*	0.1	30		NI=1
Cucumis variabilis	0.1	70		
Dichanthium sericeum subsp. *humilius*	0.1	20	MBU53-02	
Enneapogon caerulescens	0.1	20	MBU53-09	
Enneapogon polyphyllus	0.1	20		
Euphorbia biconvexa	0.1	25	MBU53-05	
Evolvulus alsinoides var. *villosicalyx*	0.1	7		
Gomphrena cunninghamii	0.1	10		
Goodenia muelleriana	0.1	20	MBU53-06	Sens. lat.
Indigofera colutea	0.1	10		
Indigofera linifolia	0.1	15	MBU53-03A	
Indigofera linnaei	0.1	20	MBU53-11	
Iseilema dolichotrichum	0.1	7	MBU53-08	
**Malvastrum americanum*	0.1	20		NI=1
Notoleptopus decaisnei	0.1	5	MBU53-01	
Polygala glaucifolia	0.1	5	MBU53-14	
Portulaca oleracea/intraterranea	0.1	5		
Pterocaulon sphacelatum	0.1	20	MBU53-17	
Ptilotus auriculifolius	0.1	15		
Rhynchosia minima	0.1	20		
Sida echinocarpa	0.1	30	MBU53-04	
Sporobolus australasicus	0.1	7		
Stemodia grossa	0.1	60		
Swainsona stenodonta	0.1	15	MBU53-03B	
Triodia epactia	0.1	50	MBU53-37	
Triodia longiceps	0.1	70		
Triodia wiseana	55	40	MBU53-18	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU54

Described by RM,MET **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803593 mE, 7545609 mN 119.943749°E, -22.168141°S

Habitat Creek bed, banks and islands; flowing E-W.

Soil Reddish brown alluvial clayey sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix* open woodland over *Acacia coriacea* subsp. *pendens* scattered low trees over *Melaleuca bracteata* scattered tall shrubs over **Cenchrus ciliaris, *C. setiger* tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Very Poor: Cattle tracks and scats; high cover of **Cenchrus* spp.

Fire Age No sign of recent fire.

Notes Native plants on banks below **Cenchrus*.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	60		Juvenile. grazed.
Acacia bivenosa	0.1	200	MBU54-43	PLDK: sens. lat.
Acacia coriacea subsp. *pendens*	2	700		
Acacia trachycarpa	0.1	40		
Achyranthes aspera	0.1	60	MBU54-36	
**Aerva javanica*	0.1	70		
Alternanthera angustifolia	0.1	25	MBU54-38	Det by M Hislop (WAH).
Alternanthera nana	0.1	10		
Alysicarpus muelleri	0.1	15	MBU54-32	
Amaranthus undulatus	0.1	45	MBU54-05	
Ammannia baccifera	0.1	15	MBU54-18B	
Ammannia multiflora	0.1	15	MBU54-18A	
Arivela viscosa	0.1	50	MBU54-02	
Atalaya hemiglauca	0.1	450		
Bergia trimera	0.1	10	MBU54-22	
Boerhavia burbidgeana	0.1	10	MBU54-26	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	10	MBU54-03	Sens lat.
Bulbostylis barbata	0.1	10	MBU54-16	
Bulbostylis turbinata	0.1	10	MBU54-23	
**Cenchrus ciliaris*	35	80		
**Cenchrus setiger*	35	80		
Centipeda minima subsp. *macrocephala*	0.1	10	MBU54-37	
**Citrullus colocynthis*	0.1	40	MBU54-45	
Corchorus parviflorus	0.1	70	MBU54-40	
Corchorus tridens	0.1	10	MBU54-25	
Cucumis variabilis	0.1	40	MBU54-10	Creeper.
Cymbopogon ambiguus	0.1	90	MBU54-39	Leaves blueish.
**Cynodon dactylon*	0.1	10	MBU54-12	
Cyperus squarrosus	0.1	30	MBU54-19	
Cyperus vaginatus	1	60		
Dactyloctenium radulans	0.1	15		
Dysphania rhadinostachya	0.1	20		Sterile.
**Echinochloa colona*	0.1	70	MBU54-15	
Enneapogon polyphyllus	0.1	40		
Eragrostis crateriformis	0.1	20	MBU54-46	Det confirmed by M Hislop (WAH).
Eragrostis cumingii	0.1	12		
Eucalyptus victrix	4.5	1400		
Euphorbia australis var. *subtomentosa*	0.1	5	MBU54-11	Prostrate.
**Euphorbia hirta*	0.1	10	MBU54-21A	
Euphorbia trigonosperma	0.1	45	MBU54-01	
Evolvulus alsinoides var. *villosicalyx*	0.1	20	MBU54-28	
Fimbristylis elegans	0.1	20	MBU54-21	PLDK: leaves long. Det confirmed by M Hislop (WAH).
Glycine canescens	0.1	30	MBU54-09	
Gossypium australe	0.1	60		Burrup Peninsula form: greener indumentum.

Species	Cover	Height	Specimen	Notes
Indigofera colutea	0.1	10		
**Indigofera hochstetteri*	0.1	15	MBU54-35	Pea. Curved pod.
Indigofera linifolia	0.1	35	MBU54-09A	
Indigofera linnaei	0.1	25	MBU54-27	
Indigofera trita subsp. *trita*	0.1	40	MBU54-33	
Ipomoea muelleri	0.1	15		
Ipomoea plebeia	0.1	70	MBU54-13	White flowers.
Ipomoea polymorpha	0.1	13	MBU54-34	
**Malvastrum americanum*	0.1	35		
Melaleuca bracteata	0.8	450	MBU54-07	
Melaleuca glomerata	0.1	600		
Perotis rara	0.1	10		
Phyllanthus erwinii	0.1	10	MBU54-29	
Pluchea rubelliflora	0.1	12	MBU54-17	
Portulaca oleracea/intraterranea	0.1	12	MBU54-20	PLDK: seeds faintly nippled.
Rhynchosia minima	0.1	25	MBU54-44	
Scaevola amblyanthera var. *centralis*	0.1	15	MBU54-04	PLDK: sens. lat.
Sida sp.	0.1	6	MBU54-30	Juvenile.
Sporobolus australasicus	0.1	35	MBU54-24	
Stemodia grossa	0.1	7		
**Trianthema portulacastrum*	0.1	15	MBU54-31	
Trianthema triquetrum	0.1	15	MBU54-14	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	30	MBU54-41	PLDK: larger flowers and long pedicel. Det by M Hislop: Difficult to place; either a variant of this taxon or a hybrid/intergrade with *T. terrestris*.
**Tribulus terrestris*	0.1	10	MBU54-42	Small flowers. Sens. lat.
Triodia longiceps	0.1	80	MBU54-08	
**Vachellia farnesiana*	0.1	250	NI=40	



Marble Bar Rd Upgrade **Site** MBU55

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 194364 mE, 7559832 mN 120.039142°E, -22.039458°S

Habitat Area of cracking clay on crest of low basalt rise; gentle slope to SW.

Soil Red (2.5YR4/6) light clay; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Sida fibulifera, Neptunia dimorphantha, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273) very open herbland with *Cynodon convergens* open annual grassland.

Veg Condition Very Good: a few plants of **Cenchrus setiger*; old cattle scats; a few bits of rubbish.

Fire Age No sign of recent fire.

Notes Conditions are very dry; lots of annuals still present but likely to be missing very delicate/short-lived spp.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	10	MBU55-35	
Alysicarpus muelleri	0.1	15	MBU55-27	PLDK: unusual form; decumbent.
Aristida contorta	0.1	15	MBU55-33A	
Aristida latifolia	0.1	15	MBU55-21	
Arivela viscosa	0.1	35	MBU55-03	
Boerhavia paludosa	0.1	12	MBU55-07	
**Cenchrus setiger*	0.1	15		
Chloris pectinata	0.1	12	MBU55-18	
Corchorus tridens	0.1	3	MBU55-19	
Crotalaria medicaginea var. *neglecta*	0.1	15	MBU55-11	
Cucumis picrocarpus	0.1	10	MBU55-25	
Cynodon convergens	20	7		
Dactyloctenium radulans	0.1	7		
Desmodium campylocaulon	0.1	20	MBU55-16A	
Desmodium muelleri	0.1	20	MBU55-09, -23	
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU55-13	
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MBU55-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU55-30	
Gomphrena cunninghamii	0.1	7		
Goodenia muelleriana	0.1	7	MBU55-17	
Heliotropium conocarpum	0.1	10	MBU55-10	
Heliotropium tanythrix	0.1	15	MBU55-32	Det confirmed by M Hislop (WAH).
Hibiscus brachysiphonius	0.1	10	MBU55-24A	Flowers mauve.
Indigofera colutea	0.1	5		
Indigofera linifolia	0.1	15		
Indigofera trita subsp. *trita*	0.1	12	MBU55-22A	
Iseilema vaginiflorum	0.1	5	MBU55-20	
Neptunia dimorphantha	1	6	MBU55-05	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	10	MBU55-12A	
Paspalidium retiglume	0.1	15	MBU55-16	
Phyllanthus maderaspatensis	0.1	15	MBU55-29	
Portulaca intraterranea	0.1	7	MBU55-02	PLDK: matches MBU51-16.
Portulaca oleracea/intraterranea	0.1	5	MBU55-01	
Ptilotus aervoides	0.1	3	MBU55-28	
Ptilotus gomphrenoides	0.1	10	MBU55-34	PLDK: sens. lat.
Rhynchosia minima	0.1	5	MBU55-09A	
Rostellularia adscendens var. *clementii*	0.1	7	MBU55-26	
Sclerolaena costata	0.1	12	MBU55-31	
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.1	20	MBU55-33	MET det.
Sida fibulifera	1	10	MBU55-04	PLDK: sens. lat.
Sporobolus australasicus	0.1	8		
Streptoglossa liatroides	0.1	6	MBU55-08	

Species	Cover	Height	Specimen	Notes
Swainsona thompsoniana	0.1	10	MBU55-12	MET det.
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.5	5	MBU55-06	
Trianthema triquetrum	0.1	5	MBU55-22B	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	5	MBU55-15	



Marble Bar Rd Upgrade **Site** MBU56

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 35 x 65 m

MGA Zone 51 192333 mE, 7557648 mN 120.019074°E, -22.058805°S

Habitat Crest and upper slope of low stony hill.

Soil Dark reddish brown (5YR 3/4) sandy clay loam.

Rock Type Kylena Formation; basalt, calcrete (bits of calcrete only at W edge of quadrat).

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Indigofera monophylla* scattered low shrubs over *Triodia epactia* hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Notes Odd shaped quadrat to fit habitat, between flows. Immediate switch to calcrete to S, supporting AiTw.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	90		Juvenile.
Acacia coriacea subsp. *pendens*	0.1	3		Bark not corky.
Acacia inaequilatera	0.1	240	MBU56-29	
Acacia synchronicia	0.1	210	MBU56-20	PLDK: sens. lat.
**Aerva javanica*	0.1	3		
Alysicarpus muelleri	0.1	12	MBU56-26	
Arivela viscosa	0.1	4		
Boerhavia coccinea	0.1	15	MBU56-13	Sens lat.
Bonamia pilbarensis	0.1	7	MBU56-06, -25	
Corchorus parviflorus	0.1	40	MBU56-03	
Crotalaria medicaginea var. *neglecta*	0.1	30	MBU56-21	
Cucumis variabilis	0.1	40		
Dactyloctenium radulans	0.1	7		
Enneapogon caerulescens	0.1	10	MBU56-07	
Enneapogon polyphyllus	0.1	20		
Eremophila longifolia	0.1	280	MBU56-28	
Euphorbia australis var. *subtomentosa*	0.1	3	MBU56-09	
Euphorbia trigonosperma	0.1	6	MBU56-11	
Evolvulus alsinoides var. *villosicalyx*	0.1	14	MBU56-17	
Gomphrena cunninghamii	0.1	7		
Goodenia forrestii	0.1	45	MBU56-15	Flowers pale yellow, with red-brown throat. Sens. lat.
Hakea lorea subsp. *lorea*	0.1	230	MBU56-22	PLDK: sens. lat.
Heliotropium cunninghamii	0.1	2	MBU56-10	
Indigofera monophylla	0.5	95	MBU56-01	
Indigofera trita subsp. *trita*	0.1	2	MBU56-14	
Notoleptopus decaisnei	0.1	15	MBU56-16	
Polygala glaucifolia	0.1	2	MBU56-24	
Ptilotus auriculifolius	0.1	10	Flowering.	
Ptilotus clementii	0.1	7		
Ptilotus exaltatus	0.1	3		
Senna artemisioides subsp. *oligophylla*	0.1	25	MBU56-19	
Senna glutinosa subsp. *glutinosa*	0.1	60	MBU56-27	
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	90	MBU56-05	MET det.
Sida echinocarpa	0.1	50	MBU56-08, -23	
Sporobolus australasicus	0.1	6		
Swainsona stenodonta	0.1	15	MBU56-12	
Tribulus hirsutus	0.1	10	MBU56-04	
Triodia epactia	35	40	MBU56-02	PLDK: sens. lat.

No photo taken.

Marble Bar Rd Upgrade **Site** MBU57

Described by RM,MET **Date** 11-Mar-20 **Type** Quadrat 70 x 30 m

MGA Zone 50 802541 mE, 7542682 mN 119.934108°E, -22.194733°S

Habitat Low stony rise / undulating plain.

Soil Reddish brown sandy clay loam.

Rock Type Mapped as ferruginous colluvium; basalt, ironstone.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Excellent: a few cattle scats, tracks.

Fire Age No sign of recent fire.

Notes Quadrat runs along a slight rise/ridge (linear). Small amounts of *Triodia longiceps* and *T. epactia* in area.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	7	MBU57-11	PLDK: sens. lat.
Acacia coriacea subsp. *pendens*	0.1	180	MBU57-39	Bark not corky.
Acacia inaequilatera	0.5	450		
Acacia tetragonophylla	0.1	190	MBU57-33	
Arivela viscosa	0.1	15	MBU57-15	Flowers yellow.
Bulbostylis barbata	0.1	14	MBU57-41	
**Cenchrus ciliaris*	0.1	35		
**Cenchrus setiger*	0.1	30		Fruiting.
Corchorus parviflorus	0.1	7	MBU57-10	
Corchorus tridens	0.1	10	MBU57-25	
Corymbia hamersleyana	0.1	550	MBU57-42	<2m in quadrat, but occurs as trees just outside quadrat. Sens lat.
Cucumis variabilis	0.1	10	MBU57-31	
Cymbopogon ambiguus	0.1	100	MBU57-28	
Dactyloctenium radulans	0.1	5		
Dysphania sp.	0.1	3	MBU57-18	Immature flowers; (*plantaginella/sphaerosperma*; inadequate material for further det.)
Enneapogon caerulescens	0.1	5	MBU57-05	
Eragrostis desertorum	0.1	65	MBU57-40	
Euphorbia australis var. *subtomentosa*	0.1	2	MBU57-03	
Euphorbia tannensis subsp. *eremophila*	0.1	25	MBU57-23	
Euphorbia trigonosperma	0.1	15	MBU57-13	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU57-30	Juvenile.
Gomphrena cunninghamii	0.1	10		Flowering.
Goodenia microptera	0.1	7		
Goodenia muelleriana	0.1	12	MBU57-24	Flowers yellow. Sens. lat.
Goodenia stobbsiana	0.1	15		Juvenile.
Hakea lorea subsp. *lorea*	0.1	45	MBU57-21	Juvenile. PLDK: sens. lat.
Heliotropium chrysocarpum	0.1	20	MBU57-35	
Indigofera colutea	0.1	10		
Indigofera linnaei	0.1	5	MBU57-26	
Indigofera monophylla	0.1	60	MBU57-34	
Notoleptopus decaisnei	0.1	15	MBU57-20	
Oldenlandia crouchiana	0.1	7	MBU57-07	PLDK: sens. lat.
Paspalidium clementii	0.1	7	MBU57-06	
Phyllanthus maderaspatensis	0.1	20	MBU57-17	
Polygala glaucifolia	0.1	3	MBU57-04	
Portulaca oleracea/intraterranea	0.1	7	MBU57-32	PLDK: seeds faintly nippled.
Ptilotus auriculifolius	0.1	25		Flowering.
Ptilotus clementii	0.1	12		
Ptilotus exaltatus	0.1	3		
Rhynchosia minima	0.1	15	MBU57-29	
Senna artemisioides subsp. *oligophylla*	0.1	50	MBU57-22	
Senna notabilis	0.1	5		Juvenile.
Senna symonii	0.1	65		
Sida echinocarpa	0.1	5	MBU57-09	

Species	Cover	Height	Specimen	Notes
Solanum horridum	0.1	3	MBU57-19	Juvenile.
Sporobolus australasicus	0.1	2		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	10	MBU57-12	
Streptoglossa sp.	0.1	5	MBU57-08	PLDK: inadequate material
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	5	MBU57-14	Orange flowers.
Trachymene oleracea subsp. *oleracea*	0.1	5	MBU57-27	
Tribulus hirsutus	0.1	10	MBU57-02	
**Tribulus terrestris*	0.1	10	MBU57-16	Stems ascending. Small flowers. Sens. lat.
Triodia epactia	0.1	35		.
Triodia longiceps	0.1	50		
Triodia wiseana	65	50	MBU57-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU58

Described by RM,MET **Date** 12-Mar-20 **Type** Quadrat 70 x 30 m

MGA Zone 50 802027 mE, 7539721 mN 119.929683°E, -22.221538°S

Habitat Low gravelly rise; gentle slope to E.

Soil Reddish brown sandy clay loam.

Rock Type Robe Pisolite; ironstone, quartz, chert; possibly also calcrete.

Vegetation *Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Triodia wiseana* open hummock grassland.

Veg Condition Very Good: some ground disturbance and cattle scats.

Fire Age Burnt 1-2 years ago.

Species	Cover	Height	Specimen	Notes
Abutilon cunninghamii	0.1	40	MBU58-16	
Acacia bivenosa	0.1	10		Juvenile.
Aristida contorta	0.1	20	MBU58-28	
Arivela viscosa	0.1	20	MBU58-24	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	15	MBU58-08, -12	
Eragrostis desertorum	0.1	40	MBU58-04	Heads to 50cm.
Eucalyptus socialis subsp. *eucentrica*	4.5	160	MBU58-33	Regrowth? Old stems to 3m.
Euphorbia biconvexa	0.1	15	MBU58-19	
Euphorbia tannensis subsp. *eremophila*	0.1	35	MBU58-29	
Euphorbia vaccaria var. *erucoides*	0.1	5	MBU58-17	
Evolvulus alsinoides var. *villosicalyx*	0.1	30	MBU58-23	
Goodenia forrestii	0.1	15	MBU58-31	Spreading. Sens. lat.
Goodenia microptera	0.1	5	MBU58-11	
Haloragis gossei var. *gossei*	0.1	5	MBU58-06	Juvenile.
Heliotropium chrysocarpum	0.1	25	MBU58-03	
Heliotropium cunninghamii	0.1	12	MBU58-01	
Hibiscus sturtii var. *campylochlamys*	0.1	15	MBU58-09, -18	Flowers mauve.
Indigofera monophylla	0.1	50	MBU58-25	
Indigofera trita subsp. *trita*	0.1	25	MBU58-22	
Notoleptopus decaisnei	0.1	12		
Paraneurachne muelleri	0.1	25		
Pluchea ferdinandi-muelleri	0.1	30		Grey-green leaves.
Pluchea tetranthera	0.1	50		
Polygala glaucifolia	0.1	2	MBU58-21	
Ptilotus axillaris	0.1	15	MBU58-26	Prostrate.
Ptilotus clementii	0.1	15		
Ptilotus exaltatus	0.1	55	MBU58-27	
Scaevola amblyanthera var. *centralis*	0.1	20	MBU58-32	PLDK: sens. lat.
Senna artemisioides subsp. *oligophylla*	0.1	15	MBU58-13	
Senna glutinosa subsp. *? chatelainiana* x subsp. *glutinosa*	0.1	45	MBU58-15	
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	20	MBU58-07	MET det.
Senna symonii	0.1	40		
Sida fibulifera	0.1	10	MBU58-10	Fruiting. PLDK: sens. lat.
Solanum horridum	0.1	15	MBU58-20	
Sporobolus australasicus	0.1	10		
Tribulus hirsutus	0.1	5	MBU58-02	
Triodia longiceps	0.1	90		Plants only in slight flow area.
Triodia wiseana	15	40	MBU58-05	PLDK: sens. lat.; long lemma lobe form, leaves almost glabrous.



Marble Bar Rd Upgrade **Site** MBU59

Described by MM **Date** 11-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 50 803012 mE, 7544672 mN 119.938297°E, -22.176696°S

Habitat Long low ridge.

Soil Dark reddish brown (5YR 3/3) sandy clay loam, calcareous.

Rock Type Robe Pisolite; some calcrete nodules.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Excellent: very old ground disturbance from telegraph line in S end of quadrat, but no effect on vegetation.

Fire Age No sign of recent fire.

Notes Ridge looks very different on aerial image due to continuous surface layer of dark ?ironstone gravel and pebbles, but vegetation is not substantially different.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	35		
Acacia inaequilatera	0.25	240		
Arivela viscosa	0.1	35	MBU59-10	
Bonamia pilbarensis	0.1	10		
Corchorus parviflorus	0.1	30	MBU59-03	
Corymbia hamersleyana	0.25	400	MBU59-01	Bark tessellated, grey-brown over dull orange. Lvs dull mid green. 'Sens. lat.'
Cucumis variabilis	0.1	70	MBU59-11	Perennial basal stems.
Cymbopogon ambiguus	0.1	90		
Eriachne mucronata (typical form)	0.1	50		
Euphorbia australis var. *subtomentosa*	0.1	15	MBU59-07	Fountain form, grey leaves.
Goodenia forrestii	0.1	20	MBU59-04	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	230	MBU59-09	Sterile. PLDK: sens. lat.
Indigofera monophylla	0.1	50	MBU59-06	
Notoleptopus decaisnei	0.1	30		
Oldenlandia crouchiana	0.1	3		Sterile. Juvenile.
Paraneurachne muelleri	0.1	40		
Polygala glaucifolia	0.1	2		
Ptilotus aervoides	0.1	2	MBU59-12	
Ptilotus auriculifolius	0.1	15		
Ptilotus clementii	0.1	10		
Senna glutinosa subsp. *glutinosa*	0.1	60		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	180	MBU59-05	MET det.
Senna notabilis	0.1	5		
Senna symonii	0.1	50	MBU59-14	
Solanum horridum	0.1	6	MBU59-13	
Sporobolus australasicus	0.1	30		
Streptoglossa decurrens	0.1	10	MBU59-08	
Tribulus hirsutus	0.1	20		
Triodia longiceps	0.1	60		1 only.
Triodia wiseana	40	50	MBU59-02	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU60

Described by MM, JK **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 806198 mE, 7521560 mN 119.973570°E, -22.384653°S

Habitat Crest and slope of low stony rise.

Soil Dark reddish brown (5YR 3/4) clay loam.

Rock Type Basalt, ?ironstone and chert.

Vegetation *Acacia inaequilatera,* (*A. pruinocarpa*) scattered tall shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Excellent.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	1	400		
Acacia pruinocarpa	0.25	250		
Aristida contorta	0.1	15		
Arivela viscosa	0.1	35		
Boerhavia coccinea	0.1	30		
Corchorus parviflorus	0.1	30	MBU60-03	
Cucumis variabilis	0.1	140		
Dysphania sp.	0.1	2		Juvenile, sterile; inadequate material for det.
Enneapogon caerulescens	0.1	20		
Enneapogon polyphyllus	0.1	25		
Eriachne mucronata (typical form)	0.1	45		
Eriachne pulchella	0.1	15		
Euphorbia tannensis subsp. *eremophila*	0.1	35		
Euphorbia vaccaria var. *erucoides*	0.1	15	MBU60-07	
Gomphrena kanisii	0.1	10	MBU60-02	
Goodenia microptera	0.1	40	MBU60-13	
Hakea lorea subsp. *lorea*	0.1	70		
Haloragis gossei var. *gossei*	0.1	20		
Hybanthus aurantiacus	0.1	15		
Indigofera monophylla	0.1	80	MBU60-11	
Oldenlandia crouchiana	0.1	10		
Paraneurachne muelleri	0.1	25		
Paspalidium clementii	0.1	20		
Polygala glaucifolia	0.1	10	MBU60-01	
Portulaca oleracea/intraterranea	0.1	20		
Ptilotus aervoides	0.1	5	MBU60-10	
Ptilotus astrolasius	0.1	25		
Ptilotus auriculifolius	0.1	10		
Ptilotus exaltatus	0.1	20		
Ptilotus obovatus var. *obovatus*	0.1	60		
Rhagodia sp. Hamersley (M. Trudgen 17794)	0.1	200		NI=1
Senna artemisioides subsp. *oligophylla*	0.1	20	MBU60-06	
Senna glutinosa subsp. *glutinosa*	0.1	180		
Senna glutinosa subsp. *pruinosa*	0.1	80		
Senna glutinosa subsp. x *luerssenii*	0.1	170	MBU60-04, -09	
Senna notabilis	0.1	10		
Sporobolus australasicus	0.1	20		
Streptoglossa bubakii	0.1	15		
Swainsona stenodonta	0.1	15	MBU60-08	
Tribulus hirsutus	0.1	15		
Tribulus suberosus	0.1	50		
Trichodesma zeylanicum var. *zeylanicum*	0.1	40		
Triodia longiceps	0.1	60		
Triodia scintillans	0.1	40	MBU60-12	
Triodia wiseana	35	70	MBU60-05	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU61

Described by RM,MET **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 802091 mE, 7537124 mN 119.930791°E, -22.244958°S

Habitat Crest of low hill.

Soil Reddish brown sandy clay loam.

Rock Type Quartz, ?ironstone, chert.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* open hummock grassland with Cleome viscosa scattered herbs.

Veg Condition Very Good: signs of mechanical disturbance; cattle scats; 1 x **Aerva*.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	12	MBU61-25	
Acacia inaequilatera	0.5	250		
Acacia pruinocarpa	0.1	100		
**Aerva javanica*	0.1	55		NI=1.
Aristida contorta	0.1	25	MBU58-28=	
Arivela viscosa	1	55	MBU61-31A	
Boerhavia coccinea	0.1	15	MBU61-02	Spreading. Sens lat.
Bonamia pilbarensis	0.1	6	MBU61-09	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	12	MBU61-26	
Corchorus tridens	0.1	5	MBU61-31B	
Crotalaria medicaginea var. *neglecta*	0.1	20	MBU61-12	
Cucumis variabilis	0.1	90	MBU61-17	
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU61-16	
Dysphania rhadinostachya	0.1	12		Sterile.
Enneapogon caerulescens	0.1	15	MBU61-01	
Enneapogon polyphyllus	0.1	20		
Euphorbia australis var. *subtomentosa*	0.1	5	MBU61-05, -23	Spreading/prostrate.
Euphorbia biconvexa	0.1	20	MBU61-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	15	MBU61-11	
Gomphrena cunninghamii	0.1	8	MBU61-13	
Gomphrena kanisii	0.1	10	MBU61-24	
Goodenia muelleriana	0.1	7	MBU61-19	
Gossypium australe	0.1	12		Burrup Peninsula form: greener indumentum.
Gossypium australe	0.1	40		Whim Creek form: greyer indumentum.
Hibiscus coatesii	0.1	5	MBU61-28	
Indigofera colutea	0.1	10	MBU61-10	
Indigofera linifolia	0.1	30	Flowering.	
Iseilema dolichotrichum	0.1	7	MBU61-07	
Notoleptopus decaisnei	0.1	12		
Oldenlandia crouchiana	0.1	10	MBU61-27	Flowers white; buds bluish. PLDK: sens. lat.
Panicum decompositum	0.1	40	MBU61-18	Sterile.
Polycarpaea corymbosa var. *corymbosa*	0.1	7		
Polygala glaucifolia	0.1	3	MBU61-06	
Portulaca oleracea/intraterranea	0.1	12	MBU61-04	PLDK: seeds faintly nippled.
Ptilotus auriculifolius	0.1	20		Flowering.
Senna notabilis	0.1	7		
Sida echinocarpa	0.1	10	MBU61-29	
Solanum horridum	0.1	7	MBU61-22	
Sporobolus australasicus	0.1	15		
Streptoglossa liatroides	0.1	12	MBU61-20	
Swainsona stenodonta	0.1	20	MBU61-03	
Tragus australianus	0.1	10	MBU61-08	
Trianthema triquetrum	0.1	10	MBU61-21	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	15	MBU61-15	PLDK: matches MBU54-41; larger flowers and long pedicel.
Trichodesma zeylanicum var. *zeylanicum*	0.1	15	MBU61-30	Juvenile.
Triodia brizoides	0.1	30		One plant.

Species	Cover	Height	Specimen	Notes
Triodia epactia	30	50		
Triodia longiceps	0.1	90		One plant.
Triodia wiseana	0.5	50		



Marble Bar Rd Upgrade **Site** MBU62

Described by AL,BRM **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803394 mE, 7531874 mN 119.944411°E, -22.292097°S

Habitat Floodplain.

Soil Strong brown (7.5YR 4/6) sandy loam.

Rock Type Calcrete, basalt (some outcropping).

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low open woodland over *Triodia longiceps,* (*T. epactia*) open hummock grassland with **Cenchrus ciliaris, *C. setiger* scattered tussock grasses and *Sporobolus australasicus,* (*Eragrostis tenellula, Dactyloctenium radulans*) open annual grassland over *Indigofera linifolia, I. linnaei, Pluchea rubelliflora, Euphorbia biconvexa* open herbland.

Veg Condition Very Good: cattle scat, tracks; **Cenchrus* and other weeds present.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	10	MBU62-47	PLDK: sens. lat.
Acacia ampliceps	0.1	90		Juvenile.
Acacia bivenosa	0.1	60		
Acacia coriacea subsp. *pendens*	0.5	350	MBU62-17	Pendulous foliage. Some dead.
Acacia pyrifolia var. *pyrifolia*	0.1	110		
**Aerva javanica*	0.1	30		Nl=10.
Alternanthera nana	0.1	20		
Alysicarpus muelleri	0.1	40		
Amaranthus undulatus	0.1	50	MBU62-43	Sterile.
Arivela viscosa	0.1	60		
Boerhavia burbidgeana	0.1	30	MBU62-39	PLDK: indumentum atypical; some type 2 hairs on older stems.
**Cenchrus ciliaris*	2	80		
**Cenchrus setiger*	0.5	30		
Centipeda minima subsp. *macrocephala*	0.1	8	MBU62-29	Sterile.
Chloris pumilio	0.1	20	MBU62-18	
**Citrullus colocynthis*	0.1	30	MBU47-51=	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	20	MBU50-25=	
Corchorus tridens	0.1	15	MBU62-10	
Cucumis variabilis	0.1	70		
Cullen leucanthum	0.1	30	MBU62-27	
Cyperus squarrosus	0.1	20	MBU62-08	
Dactyloctenium radulans	1	15		
Digitaria ctenantha	0.1	40	MBU62-35	
Dysphania plantaginella	0.1	20	MBU62-28	
Dysphania rhadinostachya subsp. *rhadinostachya*	0.1	20	MBU62-40	
**Echinochloa colona*	0.1	30	MBU62-02	
Enneapogon caerulescens	0.1	15	MBU62-19	
Eragrostis cumingii	0.1	15		
Eragrostis desertorum	0.1	45	MBU62-15	Woolly butt.
Eragrostis dielsii	0.1	7	MBU62-20	
Eragrostis leptocarpa	0.1	35	MBU62-14	
Eragrostis tenellula	4	50	MBU62-09, -31	
Eucalyptus victrix	3	850		
Euphorbia biconvexa	3	35	MBU62-07	
Euphorbia tannensis subsp. *eremophila*	0.1	30	MBU62-22	
Euphorbia vaccaria var. *erucoides*	0.1	10	MBU62-04	
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Glycine canescens	0.1	30		
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU62-23	Pink flowers.
Gomphrena cunninghamii	0.1	10		
Indigofera colutea	0.1	12		
Indigofera linifolia	5	30	REL19-09=	
Indigofera linnaei	4	12	REL19-18=	
Indigofera trita subsp. *trita*	0.1	30	MBU62-06	
Ipomoea polymorpha	0.1	20	MBU62-05	

Species	Cover	Height	Specimen	Notes
Ipomoea racemigera	0.1	20	MBU62-25	
**Malvastrum americanum*	0.1	30		
Melaleuca linophylla	0.1	160	MBU62-16	
Melhania oblongifolia	0.1	25		
Notoleptopus decaisnei	0.1	25	MBU47-41=	
Perotis rara	0.1	10		
**Physalis angulata*	0.1	40		Flowers yellow. Dentate-ovate leaves.
Pluchea rubelliflora	3	20	MBU62-03	
Polymeria ambigua	0.1	5	MBU62-38	
Portulaca filifolia	0.1	15	MBU62-26	Yellow flowers.
Portulaca oleracea/intraterranea	0.1	10		
Pterocaulon sphacelatum	0.1	10	MBU62-30	
Ptilotus auriculifolius	0.1	20		
Ptilotus exaltatus	0.1	30		
Rhynchosia minima	0.1	60		
Senna notabilis	0.1	45		
Sida echinocarpa	0.1	30	MBU62-44, -45	Juvenile.
Solanum lasiophyllum	0.1	30		
**Solanum nigrum*	0.1	15	MBU62-46	
Sporobolus actinocladus	0.1	35		
Sporobolus australasicus	8	20		
Stemodia grossa	0.1	10		
Swainsona stenodonta	0.1	30	MBU62-42	
Synaptantha tillaeacea var. *tillaeacea*	0.1	4	MBU62-34	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	25	MBU62-33	Orange flowers. PLDK: atypical indumentum, R. Butcher.
Trianthema triquetrum	0.1	15		
Tribulus hirsutus	0.1	10		
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	10	MBU47-40=	
Trichodesma zeylanicum var. *zeylanicum*	0.1	15		
Triodia epactia	5	40		
Triodia longiceps	10	110		
Triraphis mollis	0.1	45	MBU62-36	
**Vachellia farnesiana*	0.1	30		NI=3. Juveniles.
Zaleya galericulata subsp. *galericulata*	0.1	30	MBU62-41	White flowers.



Marble Bar Rd Upgrade **Site** MBU63

Described by AL,BRM **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 802640 mE, 7529334 mN 119.937580°E, -22.315146°S

Habitat Crest of low ridge.

Soil Dark reddish brown (2.5YR 3/4) sandy clay loam.

Rock Type ?Chert (smooth, striated blue rock), mudstone. Lots of outcropping (5 to 10%).

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Very Good: some weeds.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon lepidum	0.1	30	MBU63-12	PLDK: sens. lat.
Acacia bivenosa	1.5	280		
Acacia inaequilatera	0.1	60		Resprouting.
**Aerva javanica*	0.1	20		
Aristida contorta	0.1	25	MBU63-09	
Arivela viscosa	0.1	45		
Boerhavia burbidgeana	0.1	20	MBU63-06	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	20	MBU63-04	Sens lat.
Bonamia pilbarensis	0.1	10	MBU63-23	
**Cenchrus ciliaris*	0.1	40		
**Cenchrus setiger*	0.1	35		
Corchorus parviflorus	0.1	25		
Corchorus tridens	0.1	5	MBU63-07	
Corymbia hamersleyana	0.25	350		
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	15		
Dactyloctenium radulans	0.1	15		
Dichanthium sericeum subsp. *humilius*	0.1	30		
Dysphania rhadinostachya	0.1	10		Sterile.
Enneapogon caerulescens	0.1	30	MBU62-19=	
Enneapogon polyphyllus	0.1	30	MBU63-16	PLDK: sens. lat.
Eremophila forrestii subsp. *forrestii*	0.1	60	MBU63-11	
Euphorbia australis var. *subtomentosa*	0.1	20	MBU63-02	
Euphorbia biconvexa	0.1	35	MBU63-01	
Euphorbia tannensis subsp. *eremophila*	0.1	10	MBU63-10	Sterile.
Evolvulus alsinoides var. *villosicalyx*	0.1	25		
Gomphrena cunninghamii	0.1	5	MBU63-26	Juvenile. White flowers.
Gomphrena kanisii	0.1	20	MBU63-18	Pale pink flowers.
Goodenia muelleriana	0.1	15	MBU48-07=	Sens. lat.
Heliotropium chrysocarpum	0.1	20	MBU49-07=	
Heliotropium cunninghamii	0.1	20	MBU63-05	
Indigofera linifolia	0.1	20	REL19-09=	
Indigofera monophylla	0.1	80	MBU50-29=	Sterile.
Melhania oblongifolia	0.1	15		
Notoleptopus decaisnei	0.1	20		
Paraneurachne muelleri	0.1	30		
Paspalidium clementii	0.1	20	MBU63-13	
Pentalepis trichodesmoides subsp. *trichodesmoides*	0.1	60	MBU63-21	
Polygala glaucifolia	0.1	15	MBU63-15	
Portulaca oleracea/intraterranea	0.1	10		
Ptilotus aervoides	0.1	5	REL19-05=	
Ptilotus auriculifolius	0.1	30		
Ptilotus calostachyus	0.1	20		
Ptilotus clementii	0.1	10		
Ptilotus exaltatus	0.1	20		
Ptilotus gomphrenoides	0.1	17	MBU63-24	PLDK: sens. lat.
Ptilotus helipteroides	0.1	4	MBU63-22	
Salsola australis	0.1	20		

Species	Cover	Height	Specimen	Notes
Senna artemisioides subsp. *helmsii*	0.1	45		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	150		Not sticky.
Senna glutinosa subsp. x *luerssenii*	0.1	50		
Senna notabilis	0.1	15		
Sida echinocarpa	0.1	15	MBU63-25	Sterile.
Sida fibulifera	0.1	25	MBU63-14	PLDK: sens. lat.
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	35	MBU63-19	PLDK: white indumentum form.
Solanum horridum	0.1	20	MBU63-17	
Solanum lasiophyllum	0.1	50	MBU63-27	
Sporobolus australasicus	0.1	20		
Streptoglossa bubakii	0.1	15	MBU63-03	
Swainsona stenodonta	0.1	45	MBU63-08	Crimson flowers.
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	25	MBU62-33=	
Trachymene oleracea subsp. *oleracea*	0.1	10		
Tragus australianus	0.1	15	REL19-02=	
Trianthema triquetrum	0.1	10		
Tribulus hirsutus	0.1	15		
Trichodesma zeylanicum var. *zeylanicum*	0.1	20		
Triodia wiseana	40	50	MBU63-20	PLDK: sens. lat.; long lemma lobe form.
Yakirra australiensis var. *australiensis*	0.1	20		



Marble Bar Rd Upgrade **Site** MBU64

Described by AL,BRM **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803788 mE, 7526184 mN 119.949310°E, -22.343364°S

Habitat Crest and upper slope of a low rise.

Soil Reddish brown (2.5YR 4/4) sandy clay loam.

Rock Type Calcrete, ?chert (smooth, striated blue rock), mudstone. A lot of outcropping (5-10%)

Vegetation *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland with *Tribulus hirsutus* scattered herbs.

Veg Condition Excellent to Very Good.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	1	220		
Acacia inaequilatera	0.1	300		
Acacia pyrifolia var. *pyrifolia*	0.1	70		
Arivela viscosa	0.1	70		
Boerhavia burbidgeana	0.1	10	MBU64-09	PLDK: indumentum atypical; some type 2 hairs on older stems.
Bonamia pilbarensis	0.1	12	MBU63-23=	
**Cenchrus ciliaris*	0.1	30		NI=1
Corchorus lasiocarpus	0.1	12		Sterile.
Corymbia hamersleyana	0.1	100		Juvenile.
Dysphania rhadinostachya	0.1	5		Sterile.
Enneapogon caerulescens	0.1	20		
Enneapogon polyphyllus	0.1	30	MBU63-16=	PLDK: sens. lat.
Eriachne mucronata (typical form)	0.1	60	MBU64-05	
Euphorbia australis var. *subtomentosa*	0.1	10	MBU63-02=	
Evolvulus alsinoides var. *villosicalyx*	0.1	5		Sterile.
Gomphrena cunninghamii	0.1	5	MBU63-26=	
Gomphrena kanisii	0.1	20	MBU63-18=	Pale pink flowers.
Goodenia forrestii	0.1	15	MBU64-12	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	80		
Heliotropium chrysocarpum	0.1	20	MBU49-07=	
Hibiscus sturtii var. *campylochlamys*	0.1	20	MNAL02-2=	
Hybanthus aurantiacus	0.1	90		
Notoleptopus decaisnei	0.1	30	MBU47-41=	
Oldenlandia crouchiana	0.1	20	MBU64-01	Pale blue/mauve flowers. PLDK: sens. lat.
Paspalidium clementii	0.1	20	MBU63-13=	
Polygala glaucifolia	0.1	10	MBU64-08	
Portulaca oleracea/intraterranea	0.1	10		
Ptilotus auriculifolius	0.1	12		
Ptilotus clementii	0.1	20	MBU64-07	
Ptilotus exaltatus	0.1	12		
Ptilotus helipteroides	0.1	30	MBU64-06	
Senna artemisioides subsp. *helmsii*	0.1	60	MBU64-03	
Senna artemisioides subsp. *oligophylla*	0.1	70	MBU64-02	
Senna glutinosa subsp. x *luerssenii*	0.1	100		
Senna notabilis	0.1	20		
Sida fibulifera	0.1	15	MBU64-10	PLDK: sens. lat.
Solanum lasiophyllum	0.1	20	MBU64-04	
Sporobolus australasicus	0.1	20		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	15	MBU49-01=	
Streptoglossa bubakii	0.1	20	MBU63-03=	
Themeda triandra	0.1	110		
Tribulus hirsutus	0.5	20	MBU64-11	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	20	MBU47-40=	
Trichodesma zeylanicum var. *zeylanicum*	0.1	15		
Triodia longiceps	0.75	80		

Species	Cover	Height	Specimen	Notes
Triodia wiseana	45	70	MBU63-20=	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU65

Described by RM,MET **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803019 mE, 7533019 mN 119.940559°E, -22.281832°S

Habitat Gravelly undulating plain.

Soil Brown clay loam.

Rock Type Calcrete.

Vegetation *Triodia epactia* hummock grassland with **Cenchrus ciliaris, Eragrostis desertorum* scattered tussock grasses.

Veg Condition Very Good: cattle scats, some weeds.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	25	MBU65-03	
Acacia inaequilatera	0.1	240		
Acacia synchronicia	0.1	75	MBU65-34	
**Aerva javanica*	0.1	110		
Aristida contorta	0.1	20		
Arivela viscosa	0.1	15	MBU65-23	
Boerhavia burbidgeana	0.1	7	MBU65-29	PLDK: indumentum atypical; some type 2 hairs on older stems.
**Cenchrus ciliaris*	0.5	25		
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	35	MBU65-32	
Corchorus tridens	0.1	40	MBU65-38	
Cucumis variabilis	0.1	5	MBU65-24	
Dactyloctenium radulans	0.1	7		
Dichanthium sericeum subsp. *humilius*	0.1	30	MBU65-16	
Dysphania sphaerosperma	0.1	2	MBU65-10	Flowering.
Enneapogon caerulescens	0.1	35	MBU65-17, -26	
Enneapogon cylindricus	0.1	35	MBU65-01	
Eragrostis cumingii	0.1	40	MBU65-37	
Eragrostis desertorum	0.5	40	MBU65-18	
Eremophila longifolia	0.1	20	MBU65-36	Juvenile.
Euphorbia tannensis subsp. *eremophila*	0.1	25	MBU65-11	
Euphorbia vaccaria var. *erucoides*	0.1	5	MBU65-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU65-31	
Gomphrena cunninghamii	0.1	20	MBU65-02	
Goodenia forrestii	0.1	10	MBU65-19	Sens. lat.
Heliotropium chrysocarpum	0.1	20	MBU65-07	
Heliotropium cunninghamii	0.1	6	MBU65-09	
Indigofera colutea	0.1	20		
Indigofera linifolia	0.1	35		
Indigofera linnaei	0.1	5	MBU65-22	
Indigofera trita subsp. *trita*	0.1	25		
Melhania oblongifolia	0.1	30	MBU65-06	PLDK: sens. lat.
**Physalis angulata*	0.1	15	MBU65-33	Weed.
Polygala glaucifolia	0.1	3	MBU65-39	
Pterocaulon sphacelatum	0.1	7	MBU65-27	
Ptilotus auriculifolius	0.1	30		
Ptilotus axillaris	0.1	10		
Ptilotus exaltatus	0.1	35		
Sclerolaena cornishiana	0.1	25	MBU65-20	
Senna artemisioides subsp. *oligophylla* x subsp. *helmsii*	0.1	60	MBU65-30	
Senna glutinosa subsp. x *luerssenii*	0.1	70	MBU65-40	
Sida fibulifera	0.1	10	MBU65-12	PLDK: sens. lat.
Solanum horridum	0.1	5	MBU65-25	
Sporobolus australasicus	0.1	10		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	25	MBU65-04	
Streptoglossa bubakii	0.1	7	MBU65-35	
Swainsona stenodonta	0.1	50	MBU65-05	Brown flowers.

Species	Cover	Height	Specimen	Notes
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	12	MBU65-21	PLDK: atypical indumentum, R. Butcher.
Tribulus hirsutus	0.1	7	MBU65-15	
Triodia epactia	35	45	MBU65-28	PLDK: sens. lat.
Triodia longiceps	0.1	90		
Triodia wiseana	0.1	30	MBU65-08	PLDK: sens. lat.; long lemma lobe form.
Triraphis mollis	0.1	40	MBU65-13	



Marble Bar Rd Upgrade **Site** MBU66
Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 50 803175 mE, 7531155 mN 119.942424°E, -22.298622°S
Habitat Stony undulating plain.
Soil Reddish brown clay.
Rock Type Chert, basalt, ironstone.
Vegetation *Triodia epactia* hummock grassland.
Veg Condition Excellent.
Fire Age Very long unburnt.
Notes Some patches of cracking clay are spread throughout the site and general area.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	15	MBU66-30	
Acacia coriacea subsp. *pendens*	0.1	650	MBU66-54	
Acacia inaequilatera	0.1	3		
Acacia pruinocarpa	0.1	650	MBU66-01	
Aristida contorta	0.1	30		
Aristida latifolia	0.1	45	MBU66-41	
Arivela viscosa	0.1	15	MBU66-04	
Austrobryonia pilbarensis	0.1	15	MBU66-46	Prostrate.
**Bidens bipinnata*	0.1	25		NI=50.
Blumea tenella	0.1	10	MBU66-42	
Boerhavia burbidgeana	0.1	10	MBU66-10	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia paludosa	0.1	60	MBU66-49	
Bonamia pilbarensis	0.1	25	MBU66-05	
Bulbostylis barbata	0.1	7	MBU66-07	
Bulbostylis turbinata	0.1	12	MBU66-28	
**Cenchrus setiger*	0.1	40		NI=10.
Corchorus tridens	0.1	15	MBU66-17	
Crotalaria dissitiflora subsp. *benthamiana*	0.1	20	MBU66-36	
Cucumis variabilis	0.1	25	MBU66-15	
Dactyloctenium radulans	0.1	7		
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU66-21	
Enneapogon caerulescens	0.1	25	MBU66-12	
Enneapogon polyphyllus	0.1	15		
Eragrostis cumingii	0.1	30	MBU66-44	
Eragrostis leptocarpa	0.1	50	MBU66-50	
Eragrostis tenellula	0.1	25	MBU66-51	
Eriachne flaccida	0.1	40	MBU66-47	
Euphorbia biconvexa	0.1	35	MBU66-16	
Euphorbia coghlanii	0.1	2	MBU66-52	
Evolvulus alsinoides var. *villosicalyx*	0.1	12	MBU66-13	
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU66-29	
Gomphrena cunninghamii	0.1	7	MBU66-23	
Goodenia muelleriana	0.1	10	MBU66-02	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	5	MBU66-37	Corky bark. PLDK: sens. lat.
Heliotropium cunninghamii	0.1	12	MBU66-14	
Heliotropium heteranthum	0.1	2	MBU66-20	Prostrate.
Indigastrum parviflorum	0.1	25	MBU66-33	
Indigofera colutea	0.1	15		
Indigofera linifolia	0.1	20		
Indigofera linnaei	0.1	20	MBU66-27	
Iseilema dolichotrichum	0.1	10	MBU66-06	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU66-43	Flowers blue.
Operculina aequisepala	0.1	30		
Panicum laevinode	0.1	60	MBU66-45	
Paspalidium clementii	0.1	20	MBU66-25	
Phyllanthus maderaspatensis	0.1	12	MBU66-31	
Polycarpaea corymbosa var. *corymbosa*	0.1	8		

Species	Cover	Height	Specimen	Notes
Polycarpaea holtzei	0.1	4	MBU66-48	
Polygala glaucifolia	0.1	2	MBU66-09	
Portulaca oleracea/intraterranea	0.1	5	MBU66-08	PLDK: seeds distinctly nippled.
Ptilotus aervoides	0.1	5		
Ptilotus auriculifolius	0.1	15		
Ptilotus carinatus	0.1	15	MBU66-40	
Rhynchosia minima	0.1	5	MBU66-24	
Sclerolaena cornishiana	0.1	25	MBU66-53	
Senna notabilis	0.1	5	MBU66-19	
Sida echinocarpa	0.1	12	MBU66-22	
Sida fibulifera	0.1	10	MBU66-39	Prostrate 1m across. PLDK: sens. lat.
Solanum phlomoides	0.1	3	MBU66-38	Juvenile.
Sporobolus australasicus	0.1	15		
Streptoglossa bubakii	0.1	5	MBU66-18	
Swainsona stenodonta	0.1	35	MBU66-11	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	15	MBU66-26	Flowers light orange.
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	0.1	90	MBU66-32	NI=25.
Tragus australianus	0.1	12		
Tribulus hirsutus	0.1	7	MBU66-35	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10	MBU66-34	Juvenile.
Triodia brizoides	0.1	30		
Triodia epactia	40	40	MBU66-03	PLDK: sens. lat.
Triodia longiceps	0.1	80		



Marble Bar Rd Upgrade **Site** MBU67

Described by AL,BRM **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 191531 mE, 7516253 mN 120.003372°E, -22.432125°S

Habitat Gentle slope; SW-facing.

Soil Reddish brown sandy clay loam.

Rock Type Chert, shale.

Vegetation *Acacia acradenia,* (*Grevillea wickhamii* subsp. *hispidula*) tall open shrubland over *Acacia inaequilatera, Senna glutinosa* subsp. *glutinosa* x subsp. x *luerssenii* scattered shrubs over *Triodia wiseana,* (*T. scintillans*) hummock grassland

Veg Condition Excellent.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	3	400	MBU67-07	
Acacia bivenosa	0.1	140		
Acacia inaequilatera	0.5	200		
Acacia pyrifolia var. *pyrifolia*	0.1	230		
Aristida contorta	0.1	20	MBU67-15	
Arivela viscosa	0.1	50		
Boerhavia coccinea	0.1	30		
Bulbostylis barbata	0.1	5		
Corchorus lasiocarpus	0.1	20		
Cucumis variabilis	0.1	100		
Dysphania rhadinostachya	0.1	10		
Enneapogon polyphyllus	0.1	30		
Eriachne pulchella	0.1	10	MBU67-02	Sens lat.
Euphorbia boophthona	0.1	35	MBU67-16	
Fimbristylis dichotoma	0.1	20	MBU67-03	PLDK: sens. lat.; styles wholly ciliate.
Fimbristylis simulans	0.1	15	MBU67-04B	Annual sedge.
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU67-04A	Pink flowers.
Gomphrena kanisii	0.1	10	MBU67-05	White flowers.
Goodenia microptera	0.1	4		
Grevillea wickhamii subsp. *hispidula*	0.5	450	MBU67-06	
Heliotropium ovalifolium	0.1	40	MBU67-13	NI=2.
Hybanthus aurantiacus	0.1	10		
Indigofera monophylla	0.1	50		
Notoleptopus decaisnei	0.1	30		
Oldenlandia crouchiana	0.1	20		
Paspalidium clementii	0.1	10	MBU67-12	
Polycarpaea holtzei	0.1	3	MBU67-11	
Polygala glaucifolia	0.1	6	MBU67-09	Purple flowers.
Ptilotus aervoides	0.1	10	REL19-05=	
Ptilotus astrolasius	0.1	3	MBU67-14	
Ptilotus clementii	0.1	2		Sterile.
Ptilotus exaltatus	0.1	10		
Senna glutinosa subsp. *glutinosa*	0.1	170		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.3	170	REL19-16=	
Senna glutinosa subsp. *pruinosa*	0.1	50		
Senna notabilis	0.1	25		
Solanum lasiophyllum	0.1	15		
Sporobolus australasicus	0.1	15		
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	15	MBU67-17	
Tribulus suberosus	0.1	65		
Triodia longiceps	0.1	50		
Triodia scintillans	15	50	MBU67-08	
Triodia wiseana	30	40	MBU67-01	PLDK: sens. lat.; long lemma lobe form.
Yakirra australiensis var. *australiensis*	0.1	10		



Marble Bar Rd Upgrade **Site** MBU68

Described by AL,BRM **Date** 14-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 191909 mE, 7514849 mN 120.006768°E, -22.444859°S

Habitat Crest of low stony rise.

Soil Dusky red (10R 3/3) loam.

Rock Type Chert, shale.

Vegetation *Senna glutinosa* subsp. *pruinosa* scattered shrubs over *Triodia wiseana,* (*T. scintillans*) hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Quadrat located close to fenceline disturbance.

Species	Cover	Height	Specimen	Notes
Aristida contorta	0.1	20	MBU68-08	
Arivela viscosa	0.1	20		
Bonamia pilbarensis	0.1	12	MNAL02-01=	
Bulbostylis barbata	0.1	15		
Corchorus lasiocarpus	0.1	30		
Dysphania rhadinostachya	0.1	2		
Enneapogon caerulescens	0.1	12		
Enneapogon polyphyllus	0.1	30	MBU68-07	PLDK: sens. lat.
Eriachne mucronata (typical form)	0.1	35	MBU68-13	
Eriachne pulchella	0.1	20	MBU68-10	
Fimbristylis dichotoma	0.1	20	MBU67-03=	Perennial.
Fimbristylis simulans	0.1	15	MBU67-04B=	
Gomphrena kanisii	0.1	5	MBU67-05=	White flowers.
Goodenia microptera	0.1	15		
Goodenia muelleriana	0.1	4		
Heliotropium inexplicitum	0.1	15	MBU68-04	
Heliotropium ovalifolium	0.1	30	MBU68-11, -12	
Indigofera monophylla	0.1	20		
Oldenlandia crouchiana	0.1	10		
Paspalidium clementii	0.1	20	MBU68-06	
Polycarpaea holtzei	0.1	4		
Polygala glaucifolia	0.1	4	MBU68-03	
Portulaca oleracea/intraterranea	0.1	5		
Ptilotus aervoides	0.1	3	REL19-05=	
Ptilotus astrolasius	0.1	5	MBU68-09	Juvenile.
Ptilotus auriculifolius	0.1	20		
Ptilotus calostachyus	0.1	15		
Ptilotus clementii	0.1	2		
Ptilotus exaltatus	0.1	4		
Salsola australis	0.1	30		
Senna glutinosa subsp. *glutinosa*	0.1	120		Resinous.
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	110	REL19-16=	
Senna glutinosa subsp. *pruinosa*	0.5	130		
Solanum horridum	0.1	15	MBU68-14	
Solanum sp.	0.1	5		Sterile, juvenile.
Sporobolus australasicus	0.1	20		
Streptoglossa bubakii	0.1	15	MBU68-05	
Tribulus hirsutus	0.1	10		
Trichodesma zeylanicum var. *zeylanicum*	0.1	12		
Triodia scintillans	3	30	MBU68-02	
Triodia wiseana	40	70	MBU68-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU69
Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 25 x 100 m
MGA Zone 50 806162 mE, 7522693 mN 119.973003°E, -22.374438°S
Habitat Low stony rise; gentle slope to E.
Soil Reddish brown sandy clay loam.
Rock Type Ironstone/dolomite?
Vegetation *Triodia longiceps, (T. wiseana*) hummock grassland.
Veg Condition Very Good: small amount of disturbance.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon lepidum	0.1	10	MBU69-21	PLDK: sens. lat.
Acacia bivenosa	0.1	190	MBU69-16	PLDK: sens. lat.
Acacia synchronicia	0.1	120	MBU69-04	PLDK: sens. lat.
Boerhavia coccinea	0.1	15	MBU69-08A	
**Cenchrus setiger*	0.1	100		NI=1.
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	110	MBU69-07, -25	
Corymbia hamersleyana	0.1	600	MBU69-01	Sens lat.
Cucumis variabilis	0.1	20	MBU69-27	
Cymbopogon ambiguus	0.1	80	MBU69-29	
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU69-24	
Enneapogon caerulescens	0.1	15	MBU69-13	
Enneapogon polyphyllus	0.1	10		
Eragrostis xerophila	0.1	30	MBU69-10	
Euphorbia australis var. *subtomentosa*	0.1	4	MBU69-09	
Euphorbia biconvexa	0.1	15	MBU69-22	
Euphorbia boophthona	0.1	40	MBU69-32	
Evolvulus alsinoides var. *villosicalyx*	0.1	35	MBU69-26	
Hakea lorea subsp. *lorea*	0.1	4	MBU69-12	PLDK: sens. lat.
Haloragis gossei var. *gossei*	0.1	10	MBU69-23	
Indigofera monophylla	0.1	140	MBU69-17	
Notoleptopus decaisnei	0.1	10		
Phyllanthus maderaspatensis	0.1	25		
Ptilotus auriculifolius	0.1	8		
Ptilotus exaltatus	0.1	4		
Rhynchosia minima	0.1	90	MBU69-11	
Sclerolaena cornishiana	0.1	20	MBU69-28	
Senna artemisioides subsp. *helmsii*	0.1	100	MBU69-05	
Senna artemisioides subsp. *oligophylla*	0.1	100	MBU69-03	
Senna glutinosa subsp. *pruinosa*	0.1	85	MBU69-14	
Senna glutinosa subsp. x *luerssenii*	0.1	90	MBU69-06	
Senna notabilis	0.1	15		
Sida fibulifera	0.1	10	MBU69-20	PLDK: sens. lat.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	0.1	70	MBU69-33	NI=19. Det by M Hislop (WAH).
Sporobolus australasicus	0.1	30		
Swainsona stenodonta	0.1	35	MBU69-19	
Tephrosia rosea var. *clementii*	0.1	50	MBU69-18	
Tribulus hirsutus	0.1	10	MBU69-02	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10	MBU69-08	
Triodia longiceps	60	100	MBU69-31	
Triodia wiseana	2	40	MBU69-30	Cover not recorded; estimated from site photo. PLDK: sens. lat.; long lemma lobe form.
Triodia wiseana	2	75	MBU69-15	Long lemma lobes, hairy leaves.



Marble Bar Rd Upgrade **Site** MBU70
Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 50 806789 mE, 7518511 mN 119.979890°E, -22.412055°S
Habitat Low gravelly rise; gentle slope to E.
Soil Brown sandy clay loam.
Rock Type ?Ironstone, quartz.
Vegetation *Triodia longiceps, (T. wiseana)* hummock grassland.
Veg Condition Excellent to Very Good: some ground disturbance.
Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	150	MBU70-17	PLDK: sens. lat.
Aristida contorta	0.1	17		
Arivela viscosa	0.1	80	MBU70-02	
Boerhavia coccinea	0.1	30	MBU70-16	Sens lat.
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	40	MBU70-15	
Cynodon prostratus	0.1	5	MBU70-10	
Enneapogon caerulescens	0.1	15	MBU69-13=	
Enneapogon polyphyllus	0.1	15		
Eriachne pulchella	0.1	7	MBU70-09	Sens lat.
Euphorbia boophthona	0.1	30	MBU70-06	
Gomphrena cunninghamii	0.1	12	MBU70-18	
Goodenia microptera	0.1	12	MBU70-07	
Lepidium phlebopetalum	0.1	15	MBU70-19	
Notoleptopus decaisnei	0.1	12		
Portulaca oleracea/intraterranea	0.1	10	MBU70-12	PLDK: seeds distinctly nippled.
Ptilotus aervoides	0.1	5		
Ptilotus auriculifolius	0.1	12		
Ptilotus exaltatus	0.1	15		
Senna artemisioides subsp. *helmsii*	0.1	110	MBU70-03	
Senna artemisioides subsp. *oligophylla* x subsp. *helmsii*	0.1	120		
Senna glutinosa subsp. x *luerssenii*	0.1	50	MBU70-14	
Senna notabilis	0.1	25	MBU70-05	
Solanum horridum	0.1	4	MBU70-13	
Sporobolus australasicus	0.1	7		
Streptoglossa bubakii	0.1	12	MBU70-04	
Tragus australianus	0.1	7		
Tribulus hirsutus	0.1	10	MBU70-01	
Tribulus suberosus	0.1	100	MBU70-08	
Triodia brizoides	0.1	55	MBU70-11	
Triodia longiceps	45	100	MBU69-31=	
Triodia wiseana	2	60	MBU69-15=	Very hairy!



Marble Bar Rd Upgrade **Site** MBU71
Described by RM,MET **Date** 14-Mar-20 **Type** Quadrat 65 x 35 m
MGA Zone 51 192154 mE, 7513959 mN 120.008973°E, -22.452932°S
Habitat Low stony rise; gently sloping to W.
Soil Reddish brown sandy clay loam.
Rock Type Jeerinah Formation; ?dolomite.
Vegetation *Triodia scintillans,* (*T. wiseana*) hummock grassland.
Veg Condition Excellent.
Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	190	MBU71-04	PLDK: sens. lat.
Arivela viscosa	0.1	5	MBU71-23	
Boerhavia coccinea	0.1	15	MBU71-29	Sens lat.
Bonamia pilbarensis	0.1	7	MBU71-18	
Bulbostylis barbata	0.1	8	MBU71-26	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	30	MBU71-17	
Cucumis variabilis	0.1	80	MBU71-14	
Eriachne pulchella	0.1	15	MBU71-15	Sens lat.
Fimbristylis simulans	0.1	15	MBU71-05	
Gomphrena affinis subsp. *pilbarensis*	0.1	20	MBU71-32	
Gomphrena cunninghamii	0.1	12	MBU71-22	
Goodenia microptera	0.1	10	MBU71-21	
Grevillea wickhamii subsp. *hispidula*	0.1	5	MBU71-01	
Hakea lorea subsp. *lorea*	0.1	60	MBU71-28	PLDK: sens. lat.
Indigofera monophylla	0.1	40	MBU71-02	Green leaves. PLDK: sens. lat.; greener taxon.
Paspalidium clementii	0.1	35	MBU71-16	
Polycarpaea holtzei	0.1	4	MBU71-12	
Polygala glaucifolia	0.1	6	MBU71-10	
Portulaca oleracea/intraterranea	0.1	8	MBU71-13	PLDK: seeds distinctly nippled.
Ptilotus astrolasius	0.1	12	MBU71-25	
Ptilotus calostachyus	0.1	50		
Ptilotus clementii	0.1	8		
Ptilotus exaltatus	0.1	8		
Ptilotus fusiformis	0.1	35	MBU71-20	
Senna artemisioides subsp. *oligophylla*	0.1	50	MBU71-27	
Senna glutinosa subsp. *glutinosa*	0.1	70	MBU71-24	MET det.
Senna glutinosa subsp. *pruinosa*	0.1	240	MBU71-03	
Senna glutinosa subsp. x *luerssenii*	0.1	150	MBU71-30	
Senna notabilis	0.1	15		
Solanum lasiophyllum	0.1	50	MBU71-31	
Solanum sp.	0.1	12	MBU71-09	Inadequate material; could be *horridum* or *phlomoides*.
Sporobolus australasicus	0.1	10		
Trachymene oleracea subsp. *oleracea*	0.1	6	MBU71-33	
Tribulus hirsutus	0.1	6	MBU71-08	
Tribulus suberosus	0.1	75		
Trichodesma zeylanicum var. *zeylanicum*	0.1	6	MBU71-19	
Triodia epactia	0.1	60	MBU71-11	PLDK: sens. lat.
Triodia longiceps	0.1	85		
Triodia scintillans	40	50	MBU71-06	
Triodia wiseana	5	80	MBU71-07	



Marble Bar Rd Upgrade **Site** MBU72
Described by RM,MET **Date** 14-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 51 196297 mE, 7561211 mN 120.058107°E, -22.027353°S
Habitat Lower slope of stony hill; W-facing.
Soil Reddish brown sandy clay loam.
Rock Type Kylena Formation; basalt.
Vegetation *Acacia inaequilatera* tall open shrubland over *Triodia epactia* hummock grassland.
Veg Condition Excellent: minor old ground disturbance.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	3	MBU72-17	PLDK: sens. lat.
Acacia inaequilatera	3	300		
Alysicarpus muelleri	0.1	7	MBU72-24	
Aristida contorta	0.1	15		
Arivela viscosa	0.1	20	MBU72-32	
Boerhavia coccinea	0.1	15	MBU72-12	Sens lat.
Bonamia pilbarensis	0.1	20	MBU72-11	
Corchorus parviflorus	0.1	50	MBU72-10	
Enneapogon caerulescens	0.1	12	MBU72-01	
Enneapogon polyphyllus	0.1	7		
Euphorbia australis var. *subtomentosa*	0.1	10	MBU72-31	
Euphorbia trigonosperma	0.1	20	MBU72-02	
Euphorbia vaccaria var. *vaccaria*	0.1	2	MBU72-04	Prostrate.
Evolvulus alsinoides var. *villosicalyx*	0.1	6	MBU72-16	
Fimbristylis dichotoma	0.1	15	MBU72-21	PLDK: sens. lat.; styles wholly ciliate.
Gomphrena cunninghamii	0.1	12	MBU72-18A, -25	
Goodenia muelleriana	0.1	6	MBU72-23	Sens. lat.
Gossypium australe	0.1	2		Juvenile. Burrup Peninsula form: greener indumentum.
Heliotropium cunninghamii	0.1	12	MBU72-20	
Indigastrum parviflorum	0.1	10	MBU72-05	
Indigofera colutea	0.1	2		
Indigofera linifolia	0.1	5	MBU72-08	
Indigofera monophylla	0.1	70	MBU72-07	PLDK: sens. lat.
Iseilema dolichotrichum	0.1	10	MBU72-22	
Paraneurachne muelleri	0.1	30		
Paspalidium clementii	0.1	20	MBU72-28	
Portulaca oleracea/intraterranea	0.1	4	MBU72-19	PLDK: seeds faintly nippled.
Ptilotus auriculifolius	0.1	15		
Rhynchosia minima	0.1	30	MBU72-29	
Sclerolaena costata	0.1	20	MBU72-27	
Senna artemisioides subsp. *helmsii*	0.1	30	MBU72-30	
Sida echinocarpa	0.1	20	MBU72-14	
Sporobolus australasicus	0.1	10		
Streptoglossa decurrens	0.1	15	MBU72-18B	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	15	MBU72-26	PLDK: atypical indumentum, R. Butcher.
Trachymene oleracea subsp. *oleracea*	0.1	5	MBU72-15	
Tribulus hirsutus	0.1	7	MBU72-09	
Triodia epactia	50	50	MBU72-03	PLDK: sens. lat.



Marble Bar Rd Upgrade **Site** MBU75

Described by AL,BRM **Date** 14-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 197917 mE, 7563010 mN 120.074117°E, -22.011402°S

Habitat N-facing slope of a low stony hill.

Soil Dark brown (7.5YR 3/2) loam.

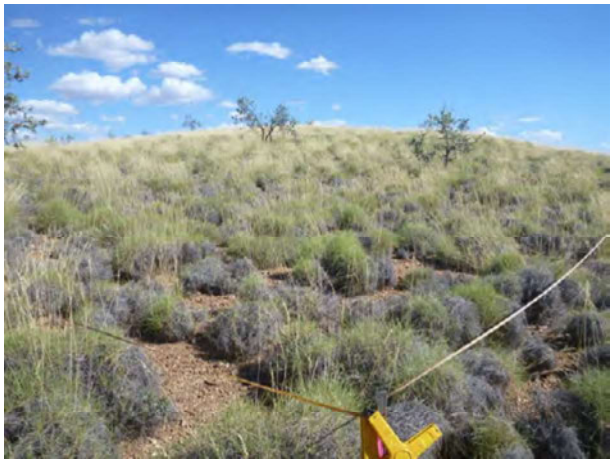
Rock Type Mosquito Creek Formation; siltstone, chert, quartz, ?dolerite.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana,* (*T. epactia*) hummock grassland with *Indigofera linifolia* scattered herbs.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.1	370		
Arivela viscosa	0.1	15		
Boerhavia coccinea	0.1	5	MBU75-02	Sterile. Sens. lat.
Bonamia pilbarensis	0.1	15	MNAL02-01=	
Bulbostylis barbata	0.1	15		
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	20	MBU50-25=	
Corymbia hamersleyana	0.1	330		
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	3		
Enneapogon caerulescens	0.1	4	MBU75-03	
Euphorbia australis var. *subtomentosa*	0.1	5	MBU75-08	
Gossypium australe	0.1	90	MBU75-07	Whim Creek form: greyer indumentum.
Indigofera colutea	0.1	10		
Indigofera linifolia	0.5	15	REL19-09=	
Notoleptopus decaisnei	0.1	20	MBU47-41=	
Polygala glaucifolia	0.1	3		
Ptilotus auriculifolius	0.1	20		
Ptilotus exaltatus	0.1	2		
Rhynchosia minima	0.1	10		
Senna artemisioides subsp. *oligophylla* x subsp. *helmsii*	0.1	50	MBU75-05	
Solanum horridum	0.1	20	MBU75-06	Sterile.
Sporobolus australasicus	0.1	20		
Tribulus hirsutus	0.1	3		
Trichodesma zeylanicum var. *zeylanicum*	0.1	15		
Triodia epactia	1	40	MBU75-04	PLDK: sens. lat.
Triodia wiseana	45	65	MBU75-01	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU78

Described by MM, JK **Date** 14-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201991 mE, 7575994 mN 120.115905°E, -21.894946°S

Habitat Saline plain; Mosquito land system.

Soil Reddish brown (2.5YR 4/4) sand.

Rock Type Mosquito Creek Formation; quartz.

Vegetation *Frankenia* sp., *Sclerolaena hostilis* scattered low shrubs over *Triodia longiceps* open hummock grassland.

Veg Condition Very Good.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Bulbostylis barbata	0.1	3	MBU78-05	
Calandrinia sp.	0.1	15	MBU78-10	Inadequate material.
Chloris pumilio	0.1	30	MBU78-06	
Dactyloctenium radulans	0.5	15		
Eragrostis dielsii	0.1	6	MBU78-04	Det confirmed by M Hislop (WAH).
Frankenia sp.	1	50	MBU78-01	Inadequate material; sterile.
Lepidium sp.	0.1	1	MBU78-07	Inadequate material; seedling.
Maireana ? eriosphaera	0.1	30	MBU78-03	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Pluchea rubelliflora	0.1	15	MBU78-09	
Portulaca oleracea/intraterranea	0.1	3	MBU78-08	
Sclerolaena hostilis	0.5	55		
Sporobolus actinocladus	0.1	30	MBU78-11	
Sporobolus australasicus	1	15	MBU78-02	
Trianthema triquetrum	0.1	3		
Triodia longiceps	20	70		



Marble Bar Rd Upgrade **Site** MBU79

Described by MM, JK **Date** 14-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 202070 mE, 7576168 mN 120.116700°E, -21.893389°S

Habitat Crest of low rocky hill.

Soil Dark reddish brown (2.5YR 3/4) clay loam.

Rock Type Mapped as ferruginous duricrust.

Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia brizoides* hummock grassland.

Veg Condition Very Good: small patch of **Cenchrus ciliaris* under dead *Acacia inaequilatera*; 2 x **Aerva*; old survey marker.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.25	230		
Acacia synchronicia	0.1	180		
**Aerva javanica*	0.1	60		NI=2.
Aristida contorta	0.1	20		
Arivela viscosa	0.1	5		
Bonamia pilbarensis	0.1	20	MBU79-13	
**Cenchrus ciliaris*	0.1	70		NI=50. Under dead *Acacia inaequilatera*.
Corchorus parviflorus	0.1	100	MBU79-06	
Cucumis variabilis	0.1	180		
Eragrostis desertorum	0.1	40	MBU79-05	
Eriachne mucronata (typical form)	0.1	40		
Eriachne pulchella	0.1	12		
Euphorbia australis var. *subtomentosa*	0.1	5	MBU79-02	PLDK: atypical; occasional minor leaf denticulations at leaf apex.
Euphorbia tannensis subsp. *eremophila*	0.1	20	MBU79-03	
Goodenia microptera	0.1	40		
Goodenia muelleriana	0.1	40	MBU79-07, -08	Sens. lat.
Indigofera monophylla	0.1	60	MBU79-01	PLDK: sens. lat.
Oldenlandia crouchiana	0.1	25		
Paraneurachne muelleri	0.1	50		
Polygala glaucifolia	0.1	2	MBU79-09	
Pterocaulon sphacelatum	0.1	30	MBU79-12	
Ptilotus auriculifolius	0.1	4		
Ptilotus rotundifolius	0.1	70		
Rhynchosia minima	0.1	50		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	0.1	50	MBU79-04	MET det.
Senna glutinosa subsp. *pruinosa*	0.1	170		
Sida echinocarpa	0.1	60		
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	50		
Sporobolus australasicus	0.1	25		
Stemodia grossa	0.1	70		
Swainsona stenodonta	0.1	5	MBU79-10	
Tribulus hirsutus	0.1	10		
Tribulus suberosus	0.1	120		
Trigastrotheca molluginea	0.1	20		
Triodia brizoides	40	60		
Triodia epactia	0.1	40	MBU79-11	PLDK: sens. lat.
Triodia longiceps	0.5	60		
Triodia wiseana	1	70		



Marble Bar Rd Upgrade **Site** MBU-REL01

Described by MM,MET **Date** 09-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 50 808424 mE, 7552912 mN 119.989152°E, -22.101400°S

Habitat Major creek; broad, shallow, sandy bed.

Soil Reddish brown (5YR 5/4) alluvial sand.

Rock Type Fluvial.

Vegetation *Eucalyptus victrix* open woodland over *Erythrina vespertilio* scattered low trees over *Melaleuca glomerata,* (*M. linophylla*) tall open scrub over **Cenchrus ciliaris, *C. setiger* tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Poor: High cover of *Cenchrus*, occasional other weeds, cattle grazing; still many native herbs and grasses present.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	70		
Acacia coriacea subsp. *pendens*	0.1	600		
Acacia trachycarpa	0.1	130		
Alternanthera denticulata	0.1	50	REL01-40	
Alternanthera nana	0.1	15		
Alysicarpus muelleri	0.1	20	REL01-30	
Amaranthus undulatus	0.1	35	REL01-12	
Ammannia baccifera	0.1	25	REL01-20	
Ammannia multiflora	0.1	25	REL01-27B	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	0.1	350		
**Bidens bipinnata*	0.1	25		
Boerhavia coccinea	0.1	40	REL01-09	Sens. lat.
Bulbostylis barbata	0.1	20	REL01-13	
Calandrinia tepperiana	0.1	20	REL01-05	
Cassytha filiformis	0.1	140	REL01-23	
**Cenchrus ciliaris*	20	30		
**Cenchrus setiger*	20	30		
Centipeda minima subsp. *macrocephala*	0.1	12	REL01-17	
**Citrullus colocynthis*	0.1	40	REL01-04A	
Corchorus parviflorus	0.1	75	REL01-44	
Corchorus tridens	0.1	20	REL01-27A	
Cucumis variabilis	0.1	120	REL01-31	Shaded.
Cyperus iria	0.1	30		
Cyperus ixiocarpus	0.1	60	REL01-37	Sticky.
Cyperus squarrosus	0.1	15	REL01-02	
Cyperus vaginatus	0.1	80		
Dactyloctenium radulans	0.1	10		
Digitaria ctenantha	0.1	30		
Diplachne fusca subsp. *fusca*	0.1	120	REL01-10	
Dysphania plantaginella	0.1	15	REL01-14, -34	
**Echinochloa colona*	0.1	30	REL01-04B	
**Eragrostis cilianensis*	0.1	15	REL01-33	
**Eragrostis cilianensis*	0.1	40	REL01-43	
Eragrostis cumingii	0.1	50	REL01-32	
Eragrostis leptocarpa	0.1	50	REL01-22	
Eriachne benthamii	0.1	90	REL01-42	Det by M Hislop (WAH).
Erythrina vespertilio	1	700		
Eucalyptus victrix	4	1200		
Eulalia aurea	0.1	130	REL01-38	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	25	REL01-29	
Euphorbia sp. (*biconvexa/coghlanii/trigonosperma*; sterile)	0.1	14	REL01-15	
Fimbristylis depauperata	0.1	40	REL01-03	
Fimbristylis microcarya	0.1	35	REL01-08, -24	
**Flaveria trinervia*	0.1	20	NI=1.	
Gomphrena cunninghamii	0.1	12		
Goodenia lamprosperma	0.1	40		

Species	Cover	Height	Specimen	Notes
Ipomoea muelleri	0.1	25		
Ipomoea plebeia	0.1	35	REL01-11	
Melaleuca glomerata	30	600	REL01-28	
Melaleuca linophylla	15	350	REL01-21	
Notoleptopus decaisnei	0.1	15		
Oldenlandia galioides	0.1	20	REL01-16	
Paspalidium rarum	0.1	10	REL01-25	
Perotis rara	0.1	15		
Phyllanthus exilis	0.1	30	REL01-36A	
Phyllanthus maderaspatensis	0.1	45	REL01-36B	
Pluchea rubelliflora	0.1	15	REL01-18	
Sesbania cannabina	0.1	80	REL01-01	
Solanum diversiflorum	0.1	25		
Solanum phlomoides	0.1	12	REL01-19	
**Sonchus oleraceus*	0.1	45	REL01-39	
Stemodia grossa	0.1	10		
Trachymene oleracea subsp. *oleracea*	0.1	15	REL01-41	
Triodia longiceps	0.1	65		
Urochloa subquadripara	0.1	30	REL01-26	
Vigna lanceolata var. *lanceolata*	0.1	20	REL01-06	



Marble Bar Rd Upgrade **Site** MBU-REL02

Described by MM **Date** 10-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 51 200150 mE, 7567222 mN 120.096498°E, -21.973782°S

Habitat Moderate-sized creek.

Soil Reddish brown (5YR 3/4) alluvial loamy sand.

Rock Type Fluvial.

Vegetation *Eucalyptus victrix* woodland over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* scattered low trees over **Cenchrus ciliaris, *C. setiger* tussock grassland.

Veg Condition Very Poor: dense cover of *Cenchrus*; grazing evident.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia colei	0.1	180	REL02-02	PLDK: sterile; var. not det.
Acacia coriacea subsp. *pendens*	1	700		
Acacia pyrifolia var. *pyrifolia*	0.1	80		
Acacia trachycarpa	0.1	250		
Alysicarpus muelleri	0.1	40	REL02-06	
Amaranthus undulatus	0.1	25	REL02-01	
Arivela viscosa	0.1	10		
Atalaya hemiglauca	1	600		
Boerhavia burbidgeana	0.1	10	REL02-03	
Bonamia media	0.1	5	REL02-12	White flowers.
Bulbostylis barbata	0.1	15	REL01-13=	
**Cenchrus ciliaris*	25	60		
**Cenchrus setiger*	25	60		
Corchorus parviflorus	0.1	45	REL02-04	
Corchorus tridens	0.1	20	REL01-27A=	
Cucumis variabilis	0.1	45	REL01-31=	
Cullen leucanthum	0.1	12		Juvenile.
Cymbopogon ambiguus	0.1	120		
Cyperus vaginatus	0.1	60		
Dactyloctenium radulans	0.1	12		
Dysphania rhadinostachya	0.1	10		
Eragrostis crateriformis	0.1	40	REL02-05	
Eragrostis cumingii	0.1	10		
Eucalyptus victrix	20	1500		
Euphorbia australis var. *subtomentosa*	0.1	15	REL02-07	Grey leaf.
Euphorbia trigonosperma	0.1	20	REL02-14	
Flueggea virosa subsp. *melanthesoides*	0.1	120		
Gomphrena cunninghamii	0.1	15		
Grevillea wickhamii subsp. *hispidula*	0.1	35		Sterile; subsp. applied from flowering collections.
Indigastrum parviflorum	0.1	20	REL02-10	
Indigofera colutea	0.1	15		
Indigofera trita subsp. *trita*	0.1	10	REL02-08	Grazed.
Ipomoea muelleri	0.1	10		
**Malvastrum americanum*	0.1	15		
Melhania oblongifolia	0.1	30	REL02-16	PLDK: sens. lat.
Notoleptopus decaisnei	0.1	20		
Phyllanthus maderaspatensis	0.1	15		
Polymeria mollis	0.1	15	REL02-15	Robust, white indumentum. Det by M Hislop (WAH).
Portulaca oleracea/intraterranea	0.1	5	REL02-13	PLDK: seeds faintly nippled.
Pterocaulon sphacelatum	0.1	2	REL02-17	Seedlings.
Rhynchosia minima	0.1	10	REL02-09	
Sesbania cannabina	0.1	60	REL01-01=	
Sporobolus australasicus	0.1	25		
Triodia longiceps	0.1	45		
**Vachellia farnesiana*	0.1	230		NI=6.



Marble Bar Rd Upgrade **Site** MBU-REL03
Described by MM **Date** 10-Mar-20 **Type** Relevé 50 x 50 m
MGA Zone 51 199151 mE, 7565727 mN 120.086559°E, -21.987100°S
Habitat Low stony hill; crest and S-facing slope.
Soil Dark brown (7.5YR 3/2) loamy sand; calcareous substrate.
Rock Type Calcrete and ?sandstone.
Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland.
Veg Condition Excellent.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	80	REL03-12	PLDK: sens. lat.
Acacia coriacea subsp. *pendens*	0.1	130		
Acacia inaequilatera	0.5	350		
**Aerva javanica*	0.1	80		NI=1.
Arivela viscosa	0.1	5		
Boerhavia coccinea	0.1	30		
Bulbostylis barbata	0.1	5		
Corchorus parviflorus	0.1	40	REL03-10	
Corymbia hamersleyana	0.1	400	REL03-01	No really good fruit. Sens. lat.
Cucumis variabilis	0.1	100		Typical form.
Euphorbia australis var. *subtomentosa*	0.1	8	REL03-14	Fountain form, grey leaf.
Gomphrena cunninghamii	0.1	15		
Goodenia muelleriana	0.1	8	REL03-13	Sens. lat.
Grevillea pyramidalis subsp. *leucadendron*	0.1	400		
Hakea lorea subsp. *lorea*	0.1	350	REL03-07	Corky grey bark. PLDK: sens. lat.
Indigofera monophylla	0.1	65	REL03-11	PLDK: sens. lat.
Notoleptopus decaisnei	0.1	6		
Polycarpaea holtzei	0.1	3		
Polygala glaucifolia	0.1	3	REL03-05	
Ptilotus auriculifolius	0.1	15		
Rhynchosia minima	0.1	15	REL03-06	
Senna artemisioides subsp. *oligophylla*	0.1	70	REL03-09	
Solanum horridum	0.1	25	REL03-04	
Sporobolus australasicus	0.1	10		
Swainsona stenodonta	0.1	20	REL03-03	
Tribulus hirsutus	0.1	5		
Triodia epactia	1	40	REL03-08	PLDK: sens. lat.
Triodia wiseana	45	50	REL03-02	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU-REL04

Described by RW,RM **Date** 05-Mar-20 **Type** Relevé 10 x 100 m

MGA Zone 51 196039 mE, 7607388 mN 120.064128°E, -21.610663°S

Habitat Creekline; bed only.

Soil Reddish brown alluvial sand.

Rock Type Chert, mudstone, quartz gravel.

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low woodland over *Eriachne benthamii,* (**Cenchrus ciliaris*) open tussock grassland.

Veg Condition Very Good: **Cenchrus* present, but mainly on banks; signs of cattle (scats).

Fire Age No sign of recent fire.

Notes *Cenchrus ciliaris is mostly on banks, where it is dense.

Species	Cover	Height	Specimen	Notes
Acacia coriacea subsp. pendens	8	450	REL04-22	
Acacia pyrifolia var. *pyrifolia*	0.1	120	REL04-17	
Acacia trachycarpa	0.1	150	REL04-19	
Alysicarpus muelleri	0.1	10	REL04-04	
Ammannia baccifera	0.1	17	REL04-13B	
Ammannia multiflora	0.1	20	REL04-13A	
**Cenchrus ciliaris*	0.5	30		
Chrysopogon fallax	0.1	40	REL04-11	
Corchorus tridens	0.1	5	REL04-05	
Cymbopogon ambiguus	0.1	110	REL04-18	
Cyperus ixiocarpus	0.1	80	REL04-20	
Cyperus squarrosus	0.1	20	REL04-15	
Dactyloctenium radulans	0.1	1		
Diplachne fusca subsp. *fusca*	0.1	60	REL04-09	
**Echinochloa colona*	0.1	50	REL04-12	
Eriachne benthamii	15	120	REL04-21	Det by M Hislop (WAH).
Eucalyptus victrix	20	900		
Eulalia aurea	0.1	80		
Euphorbia trigonosperma	0.1	25	REL04-08	
Fimbristylis microcarya	0.1	15	REL04-10	
Indigofera monophylla	0.1	60	REL04-01	
Indigofera trita subsp. *trita*	0.1	30	REL04-07	
Marsilea hirsuta	0.1	10	REL04-02	
Petalostylis labicheoides	0.1	15		
Phyllanthus maderaspatensis	0.1	20		
Pluchea dentex	0.1	35		
Polymeria ambigua	0.1	10		
Rhynchosia minima	0.1	20	REL04-06	
Sporobolus australasicus	0.1	5		
Stemodia grossa	0.1	15	REL04-14	
Trianthema triquetrum	0.1	1	REL04-16	
Triodia longiceps	0.1	50	REL04-03	



Marble Bar Rd Upgrade **Site** MBU-REL05

Described by RW,RM **Date** 06-Mar-20 **Type** Relevé 15 x 180 m

MGA Zone 51 197171 mE, 7598984 mN 120.073521°E, -21.686686°S

Habitat Moderate-sized creekline, flowing E-W.

Soil Reddish brown alluvial sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low open forest over *Eriachne benthamii* very open tussock grassland.

Veg Condition Very Good: **Cenchrus* present; evidence of cattle.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia coriacea subsp. *pendens*	8	550	REL04-22=	
Acacia pyrifolia var. *pyrifolia*	0.1	15		
**Aerva javanica*	0.1	25		
Alternanthera nana	0.1	15	REL05-08	
Amaranthus undulatus	0.1	10	REL05-07	
Arivela viscosa	0.1	15		
Atalaya hemiglauca	0.1	350	REL05-13	
Boerhavia burbidgeana	0.1	3	REL05-14	PLDK: indumentum atypical; some type 2 hairs on older stems.
**Cenchrus ciliaris*	0.1	25		
Chrysopogon fallax	0.1	40	REL04-11=	
Corchorus parviflorus	0.1	30	MBU09-03=	
Cynodon convergens	0.1	10	REL05-15	
Cyperus ixiocarpus	0.1	30	REL04-20=	
**Echinochloa colona*	0.1	35	REL05-06	
Eragrostis cumingii	0.1	10	REL05-04	
Eriachne benthamii	5	80	REL05-18	Det by M Hislop (WAH).
Eucalyptus victrix	25	900	REL05-01	
Eulalia aurea	0.1	35		
Euphorbia biconvexa	0.1	15	REL05-10	
Hybanthus aurantiacus	0.1	15		
Indigofera linnaei	0.1	10	REL05-09A	
Ipomoea muelleri	0.1	10	REL05-12	
Marsilea hirsuta	0.1	5	REL05-11	
Perotis rara	0.1	10	REL05-16	
Phyllanthus maderaspatensis	0.1	5		
Pluchea dentex	0.1	30	REL05-03	
Pluchea rubelliflora	0.1	20	REL05-05	
Polymeria ambigua	0.1	10	REL05-09	
Stemodia grossa	0.1	15	REL04-14=	
Themeda triandra	0.1	40	REL05-17	
Trianthema triquetrum	0.1	2	REL05-02	
Triodia epactia	0.1	20		Sterile.



Marble Bar Rd Upgrade **Site** MBU-REL06

Described by RW,RM **Date** 08-Mar-20 **Type** Relevé 10 x 140 m

MGA Zone 51 201227 mE, 7576543 mN 120.108618°E, -21.889863°S

Habitat Creek bank; major drainage (Nullagine River).

Soil Dark brown (7.5YR 3/2) alluvial sandy clay loam.

Rock Type N/A.

Vegetation *Eucalyptus camaldulensis* subsp. *refulgens* open forest over *Atalaya hemiglauca* scattered low trees over *Flueggea virosa* subsp. *melanthesoides,* (*Acacia ampliceps*) tall open shrubland over **Cenchrus setiger , *C. ciliaris, *Cynodon dactylon* closed tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Poor: high cover of weeds; impacts from cattle.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.5	210	REL06-24	
Achyranthes aspera	0.1	35	REL06-25	
Amaranthus undulatus	0.1	80	REL06-13	
Ammannia baccifera	0.1	25	REL06-22	
Ammannia multiflora	0.1	15	REL06-21	
Atalaya hemiglauca	1	210		
**Azadirachta indica*	0.1	40	REL06-20	NI=1.
Basilicum polystachyon	0.1	30	REL06-09	
Bothriochloa ewartiana	0.1	45	REL06-17	
**Calotropis procera*	0.1	110	REL06-11	
**Cenchrus ciliaris*	25	70		
**Cenchrus setiger*	30	70		
Centipeda minima subsp. *macrocephala*	0.1	10	REL06-04	
Cucumis variabilis	0.1	25		
**Cynodon dactylon*	20	30		
Cyperus difformis	0.1	45	REL06-19	
Cyperus vaginatus	0.5	35		
**Echinochloa colona*	0.1	35	REL06-18	NI=10
Eleocharis atropurpurea	0.1	5	REL06-02	Sedge.
Erythrina vespertilio	0.1	120	REL06-12	
Eucalyptus camaldulensis subsp. *refulgens*	55	1400	REL06-01	
Eulalia aurea	0.1	35		
Euphorbia trigonosperma	0.1	15	REL06-15	
Flueggea virosa subsp. *melanthesoides*	2	250	REL06-10	Shrub.
Ludwigia perennis	0.1	30	REL06-23	
**Malvastrum americanum*	0.1	35		NI=5
Marsilea hirsuta	0.1	20	REL06-07	
**Passiflora foetida var. hispida*	0.1	30	REL06-16	NI=2.
Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)	0.1	2	REL06-03	
Phyllanthus maderaspatensis	0.1	25		
Pluchea dentex	0.1	20		
Pterocaulon sphacelatum	0.1	20	REL06-05	
Rostellularia adscendens var. *clementii*	0.1	15	REL06-08	NI=35
Sesbania cannabina	0.1	50		
Stemodia grossa	0.1	15	REL06-06	
**Vachellia farnesiana*	0.1	150		NI=10
Vigna lanceolata var. *lanceolata*	0.1	40	REL06-14	



Marble Bar Rd Upgrade **Site** MBU-REL07

Described by MM **Date** 06-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 51 196350 mE, 7608293 mN 120.067294°E, -21.602550°S

Habitat Minor creekline through plain.

Soil Dark reddish brown (2.5YR 3/4) alluvial sand to loamy sand.

Rock Type Riverstone; basalt, quartz, ironstone chunks.

Vegetation *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* tall closed scrub over *Indigofera monophylla* scattered low shrubs over *Themeda triandra, Chrysopogon fallax, (*Cenchrus ciliaris, *Cenchrus setiger, Eriachne tenuiculmis*) tussock grassland with *Triodia epactia* scattered hummock grasses.

Veg Condition Good: both **Cenchrus* spp., and other weeds present; minor grazing.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	45	REL07-16	
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	20	REL07-28	PLDK: sens. lat.
Acacia pyrifolia var. *pyrifolia*	0.1	250	REL07-06	
Acacia trachycarpa	0.1	190		
Acacia trachycarpa x *tumida* var. *pilbarensis*	0.1	130	REL07-17	51 S 196366; 7608281. NI=1
Acacia tumida var. *pilbarensis*	80	400		
Alternanthera angustifolia	0.1	25	REL07-15	PLDK: matches MBU54-38.
Alternanthera nana	0.1	30	REL07-14	
Alysicarpus muelleri	0.1	35		
Aristida contorta	0.1	30		
Arivela viscosa	0.1	10		
Atalaya hemiglauca	0.1	300		
Boerhavia coccinea	0.1	15	REL07-07	Sens lat.
Bothriochloa ewartiana	0.1	130	REL07-32	
**Cenchrus ciliaris*	3	50		
**Cenchrus ciliaris*	0.1	50	REL07-39	Longer bristled form.
**Cenchrus setiger*	2	50		
Chrysopogon fallax	10	10	REL07-03	
Corchorus incanus subsp. *incanus*	0.1	45	REL07-08	
Corchorus parviflorus	0.1	50	REL07-37	
Corymbia hamersleyana	0.5	700	REL07-01	Sens lat.
Crotalaria medicaginea var. *neglecta*	0.1	15		
Cucumis variabilis	0.1	50	REL07-31	Indumentum atypical (coarse, dense); leaves broad.
Cymbopogon ambiguus	0.1	80	REL07-22	
Cynodon convergens	0.1	30	REL07-30	
Dactyloctenium radulans	0.1	5		
Digitaria ctenantha	0.1	50		
Enneapogon polyphyllus	0.1	40	REL07-25	PLDK: sens. lat.
Eragrostis cumingii	0.1	30	REL07-41	
Eragrostis cumingii	0.1	10	REL07-40	
Eragrostis exigua	0.1	20	REL07-33	NI=2 seen, but would be more present.
Eremophila longifolia	0.1	250		
Eriachne tenuiculmis	2	60	REL07-13	
Euphorbia biconvexa	0.1	20	REL07-12	
Evolvulus alsinoides var. *decumbens*	0.1	25		
Evolvulus alsinoides var. *villosicalyx*	0.1	15		
Fimbristylis dichotoma	0.1	40	REL07-20	PLDK: sens. lat.; styles wholly ciliate.
Goodenia microptera	0.1	10	REL07-36	
Goodenia muelleriana	0.1	30	REL07-23	Sens. lat.
Gossypium australe	0.1	70		Burrup Peninsula form: greener indumentum.
Grevillea wickhamii subsp. *hispidula*	0.1	320		Sterile; subsp. applied from flowering collections.
Heliotropium cunninghamii	0.1	20	REL07-21	
Hibiscus sturtii var. *campylochlamys*	0.1	45	REL07-26	

Species	Cover	Height	Specimen	Notes
Hibiscus sturtii var. *platychlamys*	0.1	40	REL07-35	
Hybanthus aurantiacus	0.1	30		
Indigofera colutea	0.1	5		
Indigofera monophylla	0.5	100	REL07-05	PLDK: sens. lat.
**Malvastrum americanum*	0.1	20		NI=15
Melhania oblongifolia	0.1	15	REL07-29	PLDK: sens. lat.
Notoleptopus decaisnei	0.1	20		
Paraneurachne muelleri	0.1	45		
Paspalidium rarum	0.1	25		
Perotis rara	0.1	10		
Phyllanthus maderaspatensis	0.1	40	REL07-11	
Pluchea ferdinandi-muelleri	0.1	35		
Polymeria ambigua	0.1	5	REL07-10	
Rhynchosia minima	0.1	15	REL07-34	
Senna artemisioides subsp. *oligophylla*	0.1	40	REL07-18	
Senna glutinosa subsp. *glutinosa*	0.1	190		
Sida echinocarpa	0.1	25	REL07-09	
Sida fibulifera	0.1	15	REL07-38	PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	35	REL07-24	
Sida sp. L (A.M. Ashby 4202)	0.1	20	REL07-19	
Solanum diversiflorum	0.1	45		
Sporobolus australasicus	0.1	10		
Stemodia grossa	0.1	40		
Themeda triandra	15	70	REL07-02	
Trigastrotheca molluginea	0.1	25		
Triodia epactia	2	30	REL07-04	PLDK: sens. lat.
Triodia longiceps	0.1	40		
Triumfetta clementii	0.1	50	REL07-27	



Marble Bar Rd Upgrade **Site** MBU-REL08

Described by SC **Date** 06-Mar-20 **Type** Relevé 15 x 120 m

MGA Zone 51 197489 mE, 7598532 mN 120.076509°E, -21.690818°S

Habitat Moderate-sized creekline.

Soil Reddish brown alluvial sand to sandy loam.

Rock Type Basalt, ?ironstone.

Vegetation *Eucalyptus victrix* low woodland over *Acacia trachycarpa* tall open shrubland over *Cullen leucanthum* scattered shrubs over Eria*chne benthamii, (*Cenchrus ciliaris, *Cenchrus setiger, Eulalia aurea, Eriachne tenuiculmis*) open tussock grassland over *Triodia longiceps* very open hummock grassland.

Veg Condition Good: fair bit of **Cenchrus*, some **Malvastrum*, other weeds present.

Fire Age Burnt 1-2 years ago.

Species	Cover	Height	Specimen	Notes
Acacia colei	0.1	280	REL08-01	PLDK: sterile; var. not det.
Acacia coriacea subsp. *pendens*	0.1	400		
Acacia pyrifolia var. *pyrifolia*	0.1	50		
Acacia trachycarpa	5	250		
Amaranthus undulatus	0.1	10	REL08-34	
Arivela viscosa	0.1	5		Small; sterile.
Atalaya hemiglauca	0.1	150		
Bergia pedicellaris	0.1	5	REL08-30	
Boerhavia coccinea	0.1	5	REL07-07=	
Bonamia pannosa	0.1	5		
**Cenchrus ciliaris*	5	20		NI=100+.
**Cenchrus setiger*	5	20		NI=100+.
Corchorus parviflorus	0.1	60	REL07-37=	
Crotalaria medicaginea var. *neglecta*	0.1	5		
Cucumis variabilis	0.1	30	REL08-16	Typical form.
Cullen leucanthum	1	150	MM50=	
Cyperus ixiocarpus	0.1	70	REL08-08	
Cyperus squarrosus	0.1	10	REL08-26	
Cyperus vaginatus	0.1	67	REL08-02	
Dactyloctenium radulans	0.1	5		
Diplatia grandibractea	0.1	40	REL08-35	Mistletoe, on *Euc vic* ~5m tall.
**Echinochloa colona*	0.1	20	REL08-24	Base grazed. NI=50.
Eragrostis cumingii	0.1	10	REL07-40=	
Eriachne benthamii	15	40	REL08-07	Det by M Hislop (WAH).
Eriachne tenuiculmis	1	30	REL07-13=	
Eucalyptus victrix	11	700		
Eulalia aurea	1	70	REL08-13	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	10	REL08-15, -25	
Euphorbia trigonosperma	0.1	20	REL08-12	
Fimbristylis microcarya	0.1	10	REL08-14	
Flueggea virosa subsp. *melanthesoides*	0.1	50	REL08-20	
Goodenia muelleriana	0.1	10	REL07-23=	Sens. lat.
Gossypium australe	0.1	30		Burrup Peninsula form: greener indumentum.
Heliotropium cunninghamii	0.1	10	REL08-22	
Hybanthus aurantiacus	0.1	20		
Indigofera linnaei	0.1	10	SC17=	Small red flowers.
Indigofera trita subsp. *trita*	0.1	30	REL08-32	
Ipomoea coptica	0.1	20	REL08-18	
Ipomoea muelleri	0.1	10	REL08-04	
Ludwigia perennis	0.1	10	REL08-19	
**Malvastrum americanum*	0.1	20		NI=15
Marsilea hirsuta	0.1	10	REL08-06	
Panicum decompositum	0.1	50	REL08-11	
Phyllanthus maderaspatensis	0.1	30	REL07-11=	
Pluchea dentex	0.1	20		
Pluchea rubelliflora	0.1	30	REL08-33	
Polymeria ambigua	0.1	5	REL07-10=	
Pterocaulon sphacelatum	0.1	20	REL08-21	

Species	Cover	Height	Specimen	Notes
Rotala diandra	0.1	5	REL08-29	
Schoenoplectiella laevis	0.1	30	REL08-28	
Sesbania cannabina	0.1	30	REL08-03	
Sida clementii	0.1	30	REL08-23	
Solanum diversiflorum	0.1	10		
Stemodia grossa	0.1	10	REL08-31	
**Stylosanthes hamata*	0.1	40	REL08-27	
Tephrosia supina	0.1	40	MM51=	
Trichodesma zeylanicum var. *zeylanicum*	0.1	20		
Triodia longiceps	3	30		
Vigna lanceolata var. *lanceolata*	0.1	5	REL08-05	



Marble Bar Rd Upgrade **Site** MBU-REL09

Described by SC **Date** 06-Mar-20 **Type** Relevé 15 x 180 m

MGA Zone 51 198908 mE, 7591608 mN 120.088951°E, -21.753536°S

Habitat Moderate-sized creekline.

Soil Dark reddish brown (2.5YR 3/4) sand to sandy loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Eucalyptus victrix* low woodland over **Cenchrus ciliaris, *C. setiger,* (*Eriachne tenuiculmis, Eulalia aurea*) open tussock grassland with *Triodia longiceps* very open hummock grassland and *Cyperus bifax* scattered sedges.

Veg Condition Good to Poor: considerable cover of **Cenchrus*.

Fire Age No sign of recent fire.

Notes More **Cenchrus* on W side of creek,

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	150		
Acacia colei	0.1	400	REL08-01=	PLDK: sterile; var. not det.
Acacia coriacea subsp. *pendens*	0.1	50		Sterile.
Acacia pyrifolia var. *pyrifolia*	0.1	50		
Alysicarpus muelleri	0.1	40	MBU15-01=	
Amaranthus undulatus	0.1	20	REL08-34=	
Ammannia baccifera	0.1	10	REL09-07	
Arivela viscosa	0.1	30		
Bergia ammannioides	0.1	5	REL09-12	
Boerhavia burbidgeana	0.1	20	REL09-03	PLDK: indumentum atypical; some type 2 hairs on older stems.
Calandrinia tepperiana	0.1	5	REL09-04	
**Cenchrus ciliaris*	10	40		
**Cenchrus setiger*	10	40		
Centipeda minima subsp. *macrocephala*	0.1	10	REL09-09	
Chrysopogon fallax	0.1	70		
**Citrullus colocynthis*	0.1	15	REL09-14	
Corchorus parviflorus	0.1	15	REL07-37=	
Crotalaria medicaginea var. *neglecta*	0.1	10		
Cucumis melo	0.1	50	REL09-01	
Cucumis variabilis	0.1	30	REL09-11	PLDK: Indumentum atypical (coarse, dense); leaves broad. M. Hislop (WAH): an enormously variable species as currently accepted.
Cymbopogon ambiguus	0.1	80	REL09-05	
Cyperus bifax	1	60	REL09-06	Triangular stem.
Cyperus ixiocarpus	0.1	60	REL08-08=	
Cyperus squarrosus	0.1	5	REL08-26=	
Cyperus vaginatus	0.1	60	REL08-02=	
Dactyloctenium radulans	0.1	10		
Diplatia grandibractea	0.1	40	REL09-15A	Mistletoe, ~5m high in tree.
**Echinochloa colona*	0.1	20		
Eragrostis cumingii	0.1	5	REL07-40=	
Eriachne tenuiculmis	2	60	REL07-13=	
Eucalyptus victrix	15	800		
Eulalia aurea	1	70	REL08-13=	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	5	REL08-25=	Round hairy leaves.
Euphorbia trigonosperma	0.1	20	REL09-02	
Fimbristylis microcarya	0.1	15	REL09-13	
**Flaveria trinervia*	0.1	20		NI=1
Gomphrena cunninghamii	0.1	20		
Hybanthus aurantiacus	0.1	20		
Indigofera linnaei	0.1	20	REL09-10	
Indigofera monophylla	0.1	30	MBU12-08=	Scabrid leaves. PLDK: sens. lat.; type 3.
Ludwigia perennis	0.1	5	REL08-19=	
Marsilea hirsuta	0.1	10	REL08-06=	

Species	Cover	Height	Specimen	Notes
Phyllanthus maderaspatensis	0.1	40		
Pluchea rubelliflora	0.1	5	REL08-33=	
Rhynchosia minima	0.1	20		
Schoenoplectiella laevis	0.1	10	REL09-08	
Sesbania cannabina	0.1	80		
Solanum diversiflorum	0.1	20		
Sporobolus australasicus	0.1	10		
Stemodia grossa	0.1	5		
Tephrosia rosea var. *clementii*	0.1	40	REL09-15B	
Trianthema triquetrum	0.1	5		
Triodia longiceps	3	50		
Vigna lanceolata var. *lanceolata*	0.1	30	REL08-05=	



Marble Bar Rd Upgrade **Site** MBU-REL10

Described by RM,AL **Date** 10-Mar-20 **Type** Relevé 30 x 30 m

MGA Zone 51 200419 mE, 7567418 mN 120.099136°E, -21.972060°S

Habitat Small hill crest and ridge.

Soil Reddish brown silty clay loam.

Rock Type Mosquito Creek Formation; ?siltstone, shale.

Vegetation *Acacia inaequilatera,* (*A. aphanoclada*) tall open shrubland over *Triodia wiseana,* (*T. epactia*) open hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	50	REL10-05	PLDK: sens. lat.
Acacia aphanoclada	0.5	210		Nl=47.
Acacia inaequilatera	2	300		
Arivela viscosa	0.1	20	REL10-12	Grazed.
Bonamia pilbarensis	0.1	5	REL10-15	
Corchorus parviflorus	0.1	70	REL10-13	
Cymbopogon ambiguus	0.1	90	REL10-09	
Duperreya commixta	0.1	90		
Eriachne mucronata (typical form)	0.1	35	REL10-06	
Euphorbia australis var. *subtomentosa*	0.1	2	REL10-07	
Gomphrena canescens subsp. *canescens*	0.1	7		
Gossypium australe	0.1	180		Burrup Peninsula form: greener indumentum.
Hakea lorea subsp. *lorea*	0.1	350	REL10-11	PLDK: sens. lat.
Indigastrum parviflorum	0.1	15	REL10-08	
Indigofera monophylla	0.1	70	REL10-02	PLDK: sens. lat.
Ptilotus auriculifolius	0.1	1		Grazed.
Ptilotus calostachyus	0.1	30		
Rhynchosia minima	0.1	20		
Senna artemisioides subsp. *oligophylla*	0.1	70	REL10-01	
Senna glutinosa subsp. *glutinosa*	0.1	40	REL11-01=	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	15	REL10-10	
Themeda triandra	0.1	25	REL10-14	Lots on S facing slope.
Tribulus suberosus	0.1	80		
Triodia epactia	3	30	REL10-04	PLDK: sens. lat.
Triodia wiseana	25	25	REL10-03	PLDK: sens. lat.; long lemma lobe form.



Marble Bar Rd Upgrade **Site** MBU-REL11
Described by RM,AL **Date** 10-Mar-20 **Type** Relevé 30 x 30 m
MGA Zone 51 199648 mE, 7566598 mN 120.091527°E, -21.979327°S
Habitat Undulating slope of minor hill.
Soil Reddish brown sandy clay loam.
Rock Type Mount Roe Basalt; dolerite.
Vegetation *Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* hummock grassland.
Veg Condition Excellent to Very Good: small amount of **Cenchrus*.
Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	2	300		
Amaranthus undulatus	0.1	20	REL11-03	
Arivela viscosa	0.1	30		
Bonamia pilbarensis	0.1	15	REL11-02	
Bulbostylis barbata	0.1	7	REL11-10	
**Cenchrus ciliaris*	0.1	50		NI=50.
Corchorus parviflorus	0.1	60	REL10-13=	
Cucumis variabilis	0.1	40		
Cymbopogon ambiguus	0.1	80	REL11-07	
Euphorbia australis var. *subtomentosa*	0.1	2	REL11-08	
Gomphrena canescens subsp. *canescens*	0.1	5		
Grevillea pyramidalis subsp. *leucadendron*	0.1	350	REL11-09	
Indigofera colutea	0.1	10	REL11-05	
Polycarpaea corymbosa var. *corymbosa*	0.1	10	REL11-04	
Rhynchosia minima	0.1	60		
Senna glutinosa subsp. *glutinosa*	0.1	120	REL11-01	MET det.
Sida sp.	0.1	20	REL11-06	MET det.: inadequate material; possibly *spinosa*?; atypical indumentum.
Sporobolus australasicus	0.1	15		
Stemodia grossa	0.1	40		
Tephrosia densa	0.1	40	REL11-11	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		
Triodia epactia	35	30		
Triodia longiceps	0.1	50		
Triumfetta sp.	0.1	5	REL11-12	Juvenile; inadequate material for det.



Marble Bar Rd Upgrade **Site** MBU-REL12

Described by SC **Date** 08-Mar-20 **Type** Relevé 20 x 120 m

MGA Zone 51 200985 mE, 7570109 mN 120.105104°E, -21.947876°S

Habitat Major creek; 30 m wide, with a 10 m wide bed.

Soil Reddish brown sand to sandy loam.

Rock Type Mount Roe Basalt; dolerite.

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low open forest over **Cenchrus ciliaris,* **C. setiger,* (*Eriachne tenuiculmis, Chrysopogon fallax*) tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Poor: high cover of **Cenchrus*; grazing evident.

Fire Age Burnt 1-2 years ago/No sign of recent fire.

Notes Creek bed is 10-15m wide; has 10-15 m wide strip of **Cenchrus* on either side.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	60	REL12-09	PLDK: sens. lat.
Acacia colei	0.1	40	REL08-01=	PLDK: sterile; var. not det.
Acacia coriacea subsp. *pendens*	8	600		
Acacia pyrifolia var. *pyrifolia*	0.1	120		
Acacia trachycarpa	0.1	120		
Alysicarpus muelleri	0.1	20	MBU15-01=	
Amaranthus undulatus	0.1	20	REL12-17	
Arivela viscosa	0.1	30		
Atalaya hemiglauca	0.1	40		
Boerhavia coccinea	0.1	5	MBU45-03=	Sens lat.
Bothriochloa ewartiana	0.1	70	REL12-14	
**Cenchrus ciliaris*	17	50	REL12-12	Includes longer bristled form.
**Cenchrus setiger*	15	60		
Chrysopogon fallax	1	100		
Clerodendrum floribundum var. *angustifolium*	0.1	110	REL12-01	
Corchorus parviflorus	0.1	30	REL12-03	
Corchorus tridens	0.1	10	REL12-15	
Corymbia hamersleyana	0.5	700		
Cucumis variabilis	0.1	20	REL12-05	Typical form.
Cullen leucanthum	0.1	15	REL12-10	
Cyperus vaginatus	1	60	REL08-02=	
Eragrostis tenellula	0.1	40	REL12-13	
Eremophila longifolia	0.1	300		
Eriachne tenuiculmis	1	30	REL07-13=	
Eucalyptus victrix	29	1000		
Eulalia aurea	0.1	50		
Euphorbia australis var. *subtomentosa*	0.1	10	REL12-04	Round hairy leaves.
Euphorbia biconvexa	0.1	30	REL07-12=	
Euphorbia boophthona	0.1	50	REL12-11	
Euphorbia careyi	0.1	15	MBU45-11=	
Flueggea virosa subsp. *melanthesoides*	0.1	60	REL12-02	
Gomphrena cunninghamii	0.1	10	MBU25-04=	
Gossypium australe	0.1	110	MBU45-12=	Whim Creek form: greyer indumentum.
Grevillea pyramidalis subsp. *leucadendron*	0.1	50		
Hybanthus aurantiacus	0.1	20		
Indigofera monophylla	0.1	10		
Indigofera trita subsp. *trita*	0.1	10	REL12-16	
Ipomoea muelleri	0.1	30	REL12-06	
Notoleptopus decaisnei	0.1	10		
Phyllanthus maderaspatensis	0.1	30		
Polymeria ambigua	0.1	5	REL07-10=	White flowers.
Rhynchosia minima	0.1	20		
Sesbania cannabina	0.1	20		
Sida rohlenae subsp. *rohlenae*	0.1	10	REL12-07A	
Solanum horridum	0.1	15	REL12-08	
Tephrosia rosea var. *clementii*	0.1	20	REL09-15B=	
Tribulus hirsutus	0.1	10	MBU45-02=	

Species	Cover	Height	Specimen	Notes
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		





Marble Bar Rd Upgrade **Site** MBU-REL13

Described by SC **Date** 08-Mar-20 **Type** Relevé 10 x 250 m

MGA Zone 51 201052 mE, 7567949 mN 120.105357°E, -21.967377°S

Habitat Broad major creek.

Soil Reddish brown alluvial sand.

Rock Type Riverstone.

Vegetation *Melaleuca argentea,* (*Eucalyptus camaldulensis, E. victrix, Atalaya hemiglauca*) low woodland over *Acacia ampliceps, Melaleuca glomerata* scattered tall shrubs over **Cenchrus setiger, *C. ciliaris,* (**Cynodon dactylon*) tussock grassland.

Veg Condition Poor: high cover of **Cenchrus*, and Couch; grazing from cattle.

Fire Age No sign of recent fire.

Notes Melaleuca argentea open forest present towards the S end.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	1	500	REL13-01	
Acacia coriacea subsp. *pendens*	0.1	350		
Acacia pyrifolia var. *pyrifolia*	0.1	70		
Aeschynomene indica	0.1	40	REL13-07	
Amaranthus undulatus	0.1	20	REL12-17=	
Ammannia baccifera	0.1	5	REL13-06	
Arivela viscosa	0.1	20		
Atalaya hemiglauca	2	600		
Boerhavia burbidgeana	0.1	5	REL13-02	
Calandrinia tepperiana	0.1	5	REL09-04=	
**Cenchrus ciliaris*	15	50		
**Cenchrus setiger*	30	50		
Corchorus parviflorus	0.1	60	REL12-03=	
Crotalaria cunninghamii subsp. *sturtii*	0.1	80	REL13-11	NI=7.
Cucumis variabilis	0.1	30	REL12-05=	Typical form.
Cullen leucanthum	0.1	10	REL12-10=	
**Cynodon dactylon*	2	10	REL13-04	
Cyperus iria	0.1	15	REL13-16	
Cyperus ixiocarpus	0.1	60	REL08-08=	
Cyperus squarrosus	0.1	10	REL08-26=	
Cyperus vaginatus	2	50		
**Echinochloa colona*	0.1	20		
Enteropogon ramosus	0.1	70	REL13-05	
Eragrostis cumingii	0.1	10		
Eragrostis tenellula	0.1	20	REL12-13=	
Erythrina vespertilio	0.1	25	REL13-08	
Eucalyptus camaldulensis subsp. *refulgens*	5	1200		
Eucalyptus victrix	5	1000		
Euphorbia biconvexa	0.1	20	REL07-12=	
Fimbristylis microcarya	0.1	10	REL13-18	
Hibiscus austrinus var. *austrinus*	0.1	30	REL13-12	Sterile, juvenile.
Ipomoea muelleri	0.1	20	REL12-06=	
Ludwigia perennis	0.1	10	REL08-19=	
Melaleuca argentea	10	1000		
Melaleuca glomerata	1	250		
Petalostylis labicheoides	0.1	210	REL13-13	
Phyllanthus maderaspatensis	0.1	20		
Pluchea rubelliflora	0.1	10	REL13-10	
Schoenoplectus subulatus	0.1	80	REL13-14	
Sida rohlenae subsp. *rohlenae*	0.1	20	REL12-07A=	
**Solanum nigrum*	0.1	30	REL13-15	NI=1.
Stemodia grossa	0.1	5		
Trianthema triquetrum	0.1	10	REL13-03	
Triodia longiceps	0.1	40		
**Vachellia farnesiana*	0.1	200		NI=2
Vigna lanceolata var. *lanceolata*	0.1	10	REL13-09	





Marble Bar Rd Upgrade **Site** MBU-REL14

Described by RM,SC **Date** 09-Mar-20 **Type** Relevé 20 x 140 m

MGA Zone 51 191989 mE, 7556977 mN 120.015617°E, -22.064799°S

Habitat Bed and banks of moderate-sized creek.

Soil Reddish brown sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low open woodland over *Melaleuca glomerata* tall shrubland over **Cenchrus ciliaris, *C. setiger* open tussock grassland over *Triodia longiceps* scattered hummock grasses and *Cyperus vaginatus* scattered sedges.

Veg Condition Good to Poor: weeds present; some cattle activity.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	200	REL13-01=	
Acacia bivenosa	0.1	350	REL14-06	
Acacia coriacea subsp. *pendens*	1	600		
Acacia pyrifolia var. *pyrifolia*	0.1	180		
Acacia trachycarpa	0.1	210		
Alternanthera nana	0.1	20	REL07-14=	
Alysicarpus muelleri	0.1	10	MBU15-01=	
Amaranthus undulatus	0.1	30	REL12-17=	
Arivela viscosa	0.1	10		
Atalaya hemiglauca	0.1	180		
Boerhavia burbidgeana	0.1	5	REL13-02=	
Boerhavia coccinea	0.1	10	MBU45-03=	Sens lat.
Bulbostylis barbata	0.1	5		
Calandrinia tepperiana	0.1	10	REL09-04=	
Cassytha capillaris	0.1	20		
**Cenchrus ciliaris*	10	50		
**Cenchrus setiger*	10	50		
Centipeda minima subsp. *macrocephala*	0.1	5	REL14-01	
**Citrullus colocynthis*	0.1	40	REL14-04	
Corchorus parviflorus	0.1	60	REL12-03=	
Crotalaria cunninghamii subsp. *sturtii*	0.1	10	REL13-11=	
Cucumis variabilis	0.1	50	REL12-05=	Typical form.
Cyperus squarrosus	0.1	10	REL08-26=	
Cyperus vaginatus	0.5	60		
Dactyloctenium radulans	0.1	5		
Dysphania plantaginella	0.1	5	SC28=	N=1.
Eragrostis cumingii	0.1	10		
Eragrostis leptocarpa	0.1	40	REL14-02	
Eragrostis tenellula	0.1	30	REL12-13=	
Eriachne tenuiculmis	0.1	40	REL07-13=	
Eucalyptus victrix	9	900		
Euphorbia australis var. *subtomentosa*	0.1	10	REL12-04=	Round hairy leaves.
Euphorbia biconvexa	0.1	20	REL07-12=	
Gossypium australe	0.1	5		Burrup Peninsula form: greener indumentum.
Hybanthus aurantiacus	0.1	20		
Indigofera monophylla	0.1	20		In creek.
Ipomoea muelleri	0.1	10	REL12-06=	
Ludwigia perennis	0.1	5	REL08-19=	
Marsilea hirsuta	0.1	5	REL08-06=	
Melaleuca glomerata	15	300	REL14-03	
Notoleptopus decaisnei	0.1	10		
Phyllanthus maderaspatensis	0.1	5		
Pluchea dentex	0.1	20		
Polymeria ambigua	0.1	50	REL07-10=	
Sesbania cannabina	0.1	50		
**Setaria verticillata*	0.1	40	REL14-07	NI=1.
Sporobolus actinocladus	0.1	60	REL14-05	
Stemodia grossa	0.1	5		

Species	Cover	Height	Specimen	Notes
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	0.1	60		
Trianthema triquetrum	0.1	10		
Triodia epactia	0.1	30		
Triodia longiceps	1	50		
Vigna lanceolata var. *lanceolata*	0.1	5	REL14-08	



Marble Bar Rd Upgrade **Site** MBU-REL15

Described by RM,SC **Date** 09-Mar-20 **Type** Relevé 50 x 50 m

MGA Zone 50 807182 mE, 7551686 mN 119.977360°E, -22.112681°S

Habitat Major creek; 100-150m wide.

Soil Reddish brown alluvial sand in bed; clay loam on banks.

Rock Type Ironstone, riverstone.

Vegetation *Eucalyptus victrix, E. camaldulensis* subsp. *refulgens* open forest over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* low open woodland over *Melaleuca glomerata* scattered tall shrubs over **Cenchrus setiger, *C. ciliaris* tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Poor: high cover of **Cenchrus*; cattle present.

Fire Age No sign of recent fire.

Notes Wide creek, some water pools present.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	280		
Acacia colei	0.1	90		
Acacia coriacea subsp. *pendens*	1	600		
Acacia pyrifolia var. *pyrifolia*	0.1	120		
Achyranthes aspera	0.1	20	REL15-03	
Alternanthera nana	0.1	20	REL07-14=	
Amaranthus undulatus	0.1	30	REL12-17=	
Arivela viscosa	0.1	50		
Atalaya hemiglauca	2	600		
Calandrinia tepperiana	0.1	15	REL09-04=	
**Cenchrus ciliaris*	20	30		
**Cenchrus setiger*	30	30		
Centipeda minima subsp. *macrocephala*	0.1	5	REL15-02	
Chrysopogon fallax	0.1	30		
**Citrullus colocynthis*	0.1	10	REL14-04=	
Corchorus tridens	0.1	10		
Cucumis variabilis	0.1	30		
**Cynodon dactylon*	0.1	10	REL13-04=	
Cyperus squarrosus	0.1	25	REL08-26=	
Cyperus vaginatus	0.1	30		
**Echinochloa colona*	0.1	60		
Eragrostis cumingii	0.1	30		
Eragrostis leptocarpa	0.1	60	REL14-02=	
Eucalyptus camaldulensis subsp. *refulgens*	15	1500		
Eucalyptus victrix	25	1300		
Euphorbia australis var. *subtomentosa*	0.1	20	REL08-15=	
Euphorbia biconvexa	0.1	30	REL07-12=	
**Euphorbia hirta*	0.1	30	REL15-04	
Fimbristylis microcarya	0.1	20	REL15-05	
Goodenia lamprosperma	0.1	25	REL15-01	
Ipomoea muelleri	0.1	35	REL12-06=	
Ludwigia perennis	0.1	20	REL08-19=	
**Malvastrum americanum*	0.1	30		NI=1.
Melaleuca glomerata	2	280		
Sesbania cannabina	0.1	90		
**Vachellia farnesiana*	0.1	140		NI=9.
Vigna lanceolata var. *lanceolata*	0.1	25	REL14-08=	



Marble Bar Rd Upgrade **Site** MBU-REL16

Described by RM,SC **Date** 09-Mar-20 **Type** Relevé 20 x 100 m

MGA Zone 50 805983 mE, 7550042 mN 119.966061°E, -22.127725°S

Habitat Bed and banks of major creek, flowing E-W.

Soil Reddish brown alluvial clayey sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix,* (*E. camaldulensis*) low open forest over *Melaleuca glomerata* tall open shrubland over **Cenchrus ciliaris, *C. setiger,* (**Echinochloa colona*) tussock grassland with *Cyperus vaginatus* very open sedgeland and *Potamogeton tricarinatus,* (*Ludwigia perennis*) very open herbland.

Veg Condition Poor: high cover of introduced grasses; impacts from cattle.

Fire Age No sign of recent fire.

Notes Water pools present in bed of creek.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	100	REL13-01=	
Acacia coriacea subsp. *pendens*	0.1	400		
Achyranthes aspera	0.1	20	REL15-03=	Tall herb.
**Aerva javanica*	0.1	20		
Alternanthera denticulata	0.1	30	REL16-01	
Amaranthus undulatus	0.1	20	REL12-17=	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	0.5	400		
Boerhavia burbidgeana	0.1	10	REL13-02=	
Boerhavia coccinea	0.1	10	REL16-06	Sens lat.
Bulbostylis barbata	0.1	10	REL16-17	
Bulbostylis turbinata	0.1	15	REL16-19	
**Calotropis procera*	0.1	30	REL16-18	Weed. NI=1.
**Cenchrus ciliaris*	16	50		NI=1000.
**Cenchrus setiger*	16	50		NI=1000.
Centipeda minima subsp. *macrocephala*	0.1	5	REL15-02=	
Chloris pectinata	0.1	10	REL16-14	
**Citrullus colocynthis*	0.1	5	REL14-04=	
Clerodendrum floribundum var. *angustifolium*	0.1	10	REL16-12	
Corchorus tridens	0.1	5	REL12-15=	
Crotalaria medicaginea var. *neglecta*	0.1	60		
Cullen pogonocarpum	0.1	5	REL16-11	
Cymbopogon ambiguus	0.1	50		
**Cynodon dactylon*	0.1	5	REL13-04=	
Cyperus iria	0.1	15	REL16-05	
Cyperus vaginatus	5	50		
Dactyloctenium radulans	0.1	5		
Dicladanthera forrestii	0.1	30	REL16-09	
Diplachne fusca subsp. *fusca*	0.1	90	REL16-10	Growing in water.
Dysphania rhadinostachya	0.1	10	REL16-15	Juvenile; subsp. not determined.
**Echinochloa colona*	10	50		
Eragrostis cumingii	0.1	30		
Eucalyptus camaldulensis subsp. *refulgens*	10	1000		
Eucalyptus victrix	21	800		
Euphorbia australis var. *subtomentosa*	0.1	10	REL16-08	Round hairy leaves.
Euphorbia trigonosperma	0.1	15	REL16-07	
Ludwigia perennis	1	20	REL08-19=	
**Malvastrum americanum*	0.1	20		NI=50.
Marsilea hirsuta	0.1	10	REL16-16	
Melaleuca glomerata	3	350		
Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)	0.1	1	REL16-03	
Perotis rara	0.1	5		
Phyllanthus maderaspatensis	0.1	20		
Pluchea rubelliflora	0.1	5	REL16-20	
Portulaca oleracea/intraterranea	0.1	5		
Potamogeton tricarinatus	2.5	40	REL16-02	Water weed.

Species	Cover	Height	Specimen	Notes
Pterocaulon sphacelatum	0.1	5		Juvenile.
Schoenoplectus subulatus	0.1	120	REL13-14=	Growing in water.
Sesbania cannabina	0.1	50		
Sporobolus actinocladus	0.1	15	REL14-05=	
Stemodia grossa	0.1	10		
**Trianthema portulacastrum*	0.1	5	REL16-13	
Trianthema triquetrum	0.1	5		
Triodia longiceps	0.1	50		
Typha domingensis	0.1	90	REL16-21	
**Vachellia farnesiana*	0.1	60		N=30.
Vigna lanceolata var. *lanceolata*	0.1	40	REL16-04	



Marble Bar Rd Upgrade **Site** MBU-REL17

Described by RM,AL **Date** 10-Mar-20 **Type** Relevé 20-35 x 70 m

MGA Zone 51 198868 mE, 7565264 mN 120.083735°E, -21.991229°S

Habitat Bed and banks of moderate-sized creek.

Soil Reddish brown alluvial silty clay loam.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix* woodland over *Acacia coriacea* subsp. *pendens, Atalaya hemiglauca* low open woodland over *Melaleuca glomerata,* (*M. linophylla*) tall shrubland over **Cenchrus ciliaris,* (**C. setiger*) tussock grassland with *Triodia longiceps* scattered hummock grasses and *Cyperus vaginatus* scattered sedges.

Veg Condition Poor: high cover of **Cenchrus* on banks; impacts from cattle.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia colei	0.1	100		Sterile.
Acacia coriacea subsp. *pendens*	5	800		
Acacia pyrifolia var. *pyrifolia*	0.1	80		
Alternanthera nana	0.1	25	REL17-05	NI=2.
Amaranthus undulatus	0.1	25	REL11-03=	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	5	450		
Boerhavia burbidgeana	0.1	20	REL17-14	
**Cenchrus ciliaris*	30	100		
**Cenchrus setiger*	5	40		
**Citrullus colocynthis*	0.1	10	REL17-02	
Corchorus parviflorus	0.1	55	REL10-13=	
Cucumis variabilis	0.1	90		
Cullen leucanthum	0.1	150	REL17-06, -10	
Cyperus vaginatus	0.5	70		
Dactyloctenium radulans	0.1	5		
**Echinochloa colona*	0.1	40		
Eremophila longifolia	0.1	60	REL17-11	
Eucalyptus victrix	15	1100		
Euphorbia australis var. *subtomentosa*	0.1	60	REL11-08=	
Euphorbia trigonosperma	0.1	30	REL17-04	
Flueggea virosa subsp. *melanthesoides*	0.1	60	REL17-07, -09	Resprouting.
Melaleuca glomerata	18	600		
Melaleuca linophylla	2	250	REL17-01	Fruit in spike.
Phyllanthus maderaspatensis	0.1	25	REL17-13	
Sesbania cannabina	0.1	30		
Sida fibulifera	0.1	25	REL17-12	Growing in hollow of Euc. PLDK: sens. lat.
Sporobolus australasicus	0.1	20	REL17-03	
Stemodia grossa	0.1	20		
Triodia longiceps	0.5	50		
**Vachellia farnesiana*	0.1	150		NI=1.





Marble Bar Rd Upgrade **Site** MBU-REL18

Described by RM,AL **Date** 10-Mar-20 **Type** Relevé 40-50 x 80 m

MGA Zone 51 198325 mE, 7564129 mN 120.078272°E, -22.001376°S

Habitat Creek bed, banks and islands.

Soil Reddish brown alluvial sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix, Acacia coriacea* subsp. *pendens,* (*Atalaya hemiglauca*) low woodland over *Melaleuca linophylla, M. glomerata* tall shrubland over **Cenchrus ciliaris,* (**C. setiger*) open tussock grassland with *Cyperus vaginatus* scattered sedges and *Triodia longiceps* scattered hummock grasses.

Veg Condition Poor: considerable cover of **Cenchrus*; impacts from cattle.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	130		
Acacia bivenosa	0.1	50		
Acacia colei	0.1	80		Sterile.
Acacia coriacea subsp. *pendens*	5	600		
Acacia pyrifolia var. *pyrifolia*	0.1	40		
Acacia trachycarpa	0.1	70		
Amaranthus undulatus	0.1	50	MBU17-05=	
Ammannia baccifera	0.1	15	REL18-10	
Ammannia multiflora	0.1	20	REL18-17	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	0.5	400		
Boerhavia burbidgeana	0.1	10	REL17-14=	
Bulbostylis barbata	0.1	5		
Calandrinia tepperiana	0.1	8	REL09-04=	
**Cenchrus ciliaris*	20	70		
**Cenchrus setiger*	8	50		
Cucumis variabilis	0.1	80		
Cullen leucanthum	0.1	25	REL17-10=	
Cyperus squarrosus	0.1	25	REL18-12	
Cyperus vaginatus	2	70		
Dactyloctenium radulans	0.1	10		
**Echinochloa colona*	0.1	55		
Eragrostis cumingii	0.1	15	REL18-06	
Eragrostis leptocarpa	0.1	60	REL18-05	
Eucalyptus victrix	8	1000		
Euphorbia trigonosperma	0.1	30	REL17-04=	
Fimbristylis microcarya	0.1	70	REL18-09	PLDK: sens. lat.; nutlets without or with poorly formed tubercles. Nut without projections.
Flueggea virosa subsp. *melanthesoides*	0.1	250	REL18-01	
Indigofera colutea	0.1	25	REL11-05=	
Indigofera monophylla	0.1	50	REL18-15	
Indigofera trita subsp. *trita*	0.1	20	REL18-02, -16	
Ipomoea muelleri	0.1	35	REL18-07	
Marsilea hirsuta	0.1	20	REL18-11	
Melaleuca glomerata	10	500		
Melaleuca linophylla	13	300	REL17-01=	Fruit in spike.
Notoleptopus decaisnei	0.1	30	REL18-13	
Phyllanthus maderaspatensis	0.1	20	REL17-13=	
Pluchea rubelliflora	0.1	20	REL18-08	
Polymeria ambigua	0.1	30	REL18-14	
Rhynchosia minima	0.1	30		
Sesbania cannabina	0.1	60		
Sporobolus australasicus	0.1	20		
Stemodia grossa	0.1	15		
Tephrosia rosea var. *clementii*	0.1	20	REL18-04	
Trianthema triquetrum	0.1	15	REL18-03	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		

Species	Cover	Height	Specimen	Notes
Triodia longiceps	0.5	60		



Marble Bar Rd Upgrade **Site** MBU-REL19

Described by AL,BRM **Date** 12-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 50 802672 mE, 7535174 mN 119.936789°E, -22.262450°S

Habitat Moderate slope of stony hill; W-facing.

Soil Reddish brown sandy loam.

Rock Type Robe Pisolite; ironstone.

Vegetation *Senna glutinosa* subsp. *glutinosa* x subsp. x *luerssenii* scattered low shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Very Good: some ground disturbance (pits and erosion).

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	50		
Acacia synchronicia	0.1	160		
**Aerva javanica*	0.1	50		NI=5.
Alysicarpus muelleri	0.1	10		
Amaranthus ? interruptus	0.1	25	REL19-15	Poor material.
Aristida contorta	0.1	25	REL19-06	
Arivela viscosa	0.1	35		
Boerhavia burbidgeana	0.1	25	REL19-07	PLDK: indumentum atypical; some type 2 hairs on older stems.
Bulbostylis barbata	0.1	15	REL19-13	
**Cenchrus ciliaris*	0.1	30		NI=1.
Corchorus parviflorus	0.1	30	MBU47-24=	
Dactyloctenium radulans	0.1	10		
Dichanthium sericeum subsp. *humilius*	0.1	50		
Dysphania rhadinostachya	0.1	5		
Enneapogon caerulescens	0.1	20	MBU47-18=	
Enneapogon polyphyllus	0.1	20	MBU50-20=	
Eriachne pulchella	0.1	20	REL19-01	Sens lat.
Euphorbia australis var. *subtomentosa*	0.1	5	REL19-17	
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Gomphrena cunninghamii	0.1	10		
Goodenia muelleriana	0.1	20	MBU48-07=	Sens. lat.
Heliotropium heteranthum	0.1	3	REL19-10	Prostrate.
Indigofera colutea	0.1	20		
Indigofera linifolia	0.1	25	REL19-09	
Indigofera linnaei	0.1	15	REL19-18	
Iseilema dolichotrichum	0.1	10	MBU48-04=	
Notoleptopus decaisnei	0.1	25	MBU47-41=	
Oldenlandia crouchiana	0.1	3	REL19-03	PLDK: sens. lat.
Paspalidium clementii	0.1	10	REL19-04	
Polycarpaea corymbosa var. *corymbosa*	0.1	12		
Polycarpaea holtzei	0.1	4		
Portulaca oleracea/intraterranea	0.1	12		
Ptilotus aervoides	0.1	10	REL19-05	
Ptilotus auriculifolius	0.1	5		
Ptilotus exaltatus	0.1	5		
Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	1	80	REL19-16	Non-resinous. MET det.
Senna glutinosa subsp. *pruinosa*	0.1	60		
Senna glutinosa subsp. x *luerssenii*	0.1	150		Slightly glaucous, spaced out leaflets.
Senna notabilis	0.1	15		
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	0.1	80	REL19-08	Number not recorded, entered as N=1. PLDK: matches 69-33.
Sporobolus australasicus	0.1	10		
Streptoglossa bubakii	0.1	2	MBU48-05=	
Streptoglossa decurrens	0.1	4		
Swainsona stenodonta	0.1	30	REL19-14	
Tragus australianus	0.1	25	REL19-02	

Species	Cover	Height	Specimen	Notes
Tribulus hirsutus	0.1	15		
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	15	MBU47-40=	
Trichodesma zeylanicum var. *zeylanicum*	0.1	20		
Triodia brizoides	0.1	30	REL19-11	
Triodia epactia	1	40		
Triodia longiceps	55	90	MBU50-03=	
Triodia wiseana	0.1	25		



Marble Bar Rd Upgrade **Site** MBU-REL20

Described by AL,BRM **Date** 13-Mar-20 **Type** Relevé 40 x 50 m

MGA Zone 50 805766 mE, 7523786 mN 119.968952°E, -22.364648°S

Habitat Gently sloping foot slope; NE-facing.

Soil Reddish brown silty clay loam.

Rock Type Colluvial; calcrete, ironstone.

Vegetation *Acacia aptaneura, (A. ayersiana)* low woodland over *A. marramamba* scattered tall shrubs over *Triodia longiceps, T. epactia* hummock grassland.

Veg Condition Very Good: occasional **Bidens*; Telstra line adjacent to relevé on western side; cattle scat.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Pilbara (W.R. Barker 2025)	0.1	5	REL20-06	
Acacia aptaneura	20	500	REL20-01	
Acacia ayersiana	1.5	450	REL20-04	
Acacia ayersiana (narrow phyllode variant)	0.1	220	REL20-13	
Acacia marramamba	1	260	REL20-20	Smooth bark, not corky.
Aristida contorta	0.1	20		
**Bidens bipinnata*	0.1	20		Sterile.
Corchorus lasiocarpus	0.1	15		
Cucumis variabilis	0.1	20		
Dactyloctenium radulans	0.1	10		
Duperreya commixta	0.1	60		
Dysphania rhadinostachya	0.1	5		
Enneapogon caerulescens	0.1	30		
Enneapogon polyphyllus	0.1	20	MBU63-16=	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	10	REL20-09	
Euphorbia biconvexa	0.1	20	REL20-05	
Grevillea berryana	0.1	300	REL20-19	
Heliotropium chrysocarpum	0.1	25	MBU49-07=	
Iseilema dolichotrichum	0.1	10	REL20-11	
Maireana georgei	0.1	30	REL20-17	Grey, terete, hairy leaves. PLDK-Sens lat.
Maireana melanocoma	0.1	30	REL20-18	
Maireana planifolia	0.1	40	REL20-10	
Oldenlandia crouchiana	0.1	12		
Ptilotus exaltatus	0.1	5		
Ptilotus schwartzii	0.1	30		
Senna artemisioides subsp. *helmsii*	0.1	50	REL20-02	
Senna glutinosa subsp. *? chatelainiana* x subsp. *glutinosa*	0.1	120	REL20-12	Not sticky. MET det.
Senna notabilis	0.1	5		
Solanum ? horridum	0.1	5		Sterile.
Sporobolus australasicus	0.1	20		
Streptoglossa bubakii	0.1	10	MBU63-03=	
Trachymene oleracea subsp. *oleracea*	0.1	15		
Trianthema triquetrum	0.1	20		
Tribulus hirsutus	0.1	5		
Trichodesma zeylanicum var. *zeylanicum*	0.1	15		
Triodia brizoides	0.5	40	REL20-16	Sterile.
Triodia epactia	15	60		
Triodia longiceps	20	50		



Marble Bar Rd Upgrade **Site** MBU-REL21

Described by AL,BRM **Date** 13-Mar-20 **Type** Relevé 40 x 100 m

MGA Zone 50 806304 mE, 7520881 mN 119.974728°E, -22.390760°S

Habitat Major drainage line; creek banks and stony creek bed.

Soil Reddish brown loamy sand to sandy loam (banks); alluvial sand (bed).

Rock Type Basalt, chert.

Vegetation *Eucalyptus camaldulensis, (E. victrix)* open forest over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* scattered low trees over **Cenchrus ciliaris* open tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Very Poor to Very Good: cattle scats and tracks; high cover of **Cenchrus* on banks.

Fire Age No sign of recent fire.

Notes **Cenchrus* at 50-60% cover on bank; ~13% over whole relevé. Condition of creek bank is Very Poor; condition of creek bed is Very Good.

Species	Cover	Height	Specimen	Notes
Abutilon cunninghamii	0.1	20	REL21-11	
Abutilon fraseri subsp. *fraseri*	0.1	30	REL21-12	
Acacia bivenosa	0.1	80		
Acacia coriacea subsp. *pendens*	0.5	430	REL21-07	
Acacia pyrifolia var. *pyrifolia*	0.1	120		
**Aerva javanica*	0.1	60		
Alysicarpus muelleri	0.1	40		
Amaranthus undulatus	0.1	20	REL21-02	
Arivela viscosa	0.1	50		
Atalaya hemiglauca	1	350		
Boerhavia sp.	0.1	10		Sterile; not collected.
**Cenchrus ciliaris*	13	60		
**Cenchrus setiger*	0.1	60		
**Citrullus colocynthis*	0.1	10	MBU47-51=	
Corchorus lasiocarpus	0.1	60		
Corchorus tridens	0.1	10		Sterile.
Crotalaria medicaginea var. *neglecta*	0.1	20		
Cucumis variabilis	0.1	120		
Cymbopogon ambiguus	0.1	70	REL21-06	Blue leaf.
Cyperus vaginatus	1	70		
Eucalyptus camaldulensis subsp. *refulgens*	25	1200		
Eucalyptus victrix	10	1200		
Euphorbia tannensis subsp. *eremophila*	0.1	20	REL21-03	
Euphorbia vaccaria var. *erucoides*	0.1	10	MBU62-04=	
Euphorbia sp. (*biconvexa/coghlanii/trigonosperma*; sterile)	0.1	20		Sterile.
Evolvulus alsinoides	0.1	5		Juvenile.
**Flaveria trinervia*	0.1	20		NI=21.
Gossypium robinsonii	0.1	30		
Hybanthus aurantiacus	0.1	30		
Indigofera colutea	0.1	15		
Indigofera monophylla	0.1	20		
Indigofera trita subsp. *trita*	0.1	20	MBU62-06=	
Ipomoea plebeia	0.1	30	REL21-04, -10	
Jasminum didymum subsp. *lineare*	0.1	40		
**Malvastrum americanum*	0.1	40		NI=2
Notoleptopus decaisnei	0.1	10		
Phyllanthus maderaspatensis	0.1	45		
Pluchea rubelliflora	0.1	15	MBU62-03=	
Polymeria ambigua	0.1	2	REL21-05	
Pterocaulon sphacelatum	0.1	5	REL21-08	Juvenile.
Ptilotus exaltatus	0.1	10		
Rhynchosia minima	0.1	40		
Senna notabilis	0.1	20		
Stemodia grossa	0.1	5		
Streptoglossa bubakii	0.1	5	REL21-09	
Tephrosia rosea var. *clementii*	0.1	45	REL21-01	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10		

Species	Cover	Height	Specimen	Notes
**Vachellia farnesiana*	0.1	180		NI=25





Marble Bar Rd Upgrade **Site** MBU-REL22

Described by RM,MET **Date** 14-Mar-20 **Type** Relevé 20 x 125 m

MGA Zone 50 807657 mE, 7517580 mN 119.988492°E, -22.420299°S

Habitat Minor drainage line.

Soil Reddish brown alluvial sandy clay loam.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix* open woodland over *Acacia coriacea* subsp. *pendens, Atalaya hemiglauca* low open woodland over *Acacia pyrifolia* var. *pyrifolia* tall open shrubland over *Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) scattered low shrubs.

Veg Condition Very Good: some weeds present.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia coriacea subsp. *pendens*	2	700	REL22-16	
Acacia pyrifolia var. *pyrifolia*	3	250	REL22-01	
**Aerva javanica*	0.1	90		NI=3.
Amaranthus undulatus	0.1	15	REL22-05	
Arivela viscosa	0.1	60	REL23-06=	
Atalaya hemiglauca	2	550		
Boerhavia coccinea	0.1	15	REL22-14	
**Cenchrus ciliaris*	0.1	90		NI=2.
Corchorus parviflorus	0.1	55	REL22-07	NI=7.
Cucumis variabilis	0.1	25	REL22-06	
Cymbopogon ambiguus	0.1	85	REL22-11	
Ehretia saligna var. *saligna*	0.1	450	REL22-17	
Eriachne mucronata (typical form)	0.1	40	REL22-15	
Eriachne tenuiculmis	0.1	60	REL22-08	
Eucalyptus victrix	5	1100		
Euphorbia biconvexa	0.1	12	REL22-04	
Gomphrena cunninghamii	0.1	10	REL22-12	
Gossypium robinsonii	0.1	130	REL22-18	
Grevillea wickhamii subsp. *hispidula*	0.1	320	REL22-09	
Hybanthus aurantiacus	0.1	35	REL22-03	PLDK: sens. lat.
Indigofera monophylla	0.1	90	REL22-10	
**Malvastrum americanum*	0.1	40		
Phyllanthus maderaspatensis	0.1	55	REL22-13	
Senna notabilis	0.1	7		
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	2	90	REL22-02	
Triodia longiceps	0.1	110		
**Vachellia farnesiana*	0.1	60		



Marble Bar Rd Upgrade **Site** MBU-REL23

Described by RM,MET **Date** 14-Mar-20 **Type** Relevé 20 x 125 m

MGA Zone 50 807657 mE, 7517580 mN 119.988492°E, -22.420299°S

Habitat Creek banks and floodplain.

Soil Reddish brown alluvial sandy clay loam.

Rock Type Ironstone.

Vegetation *Atalaya hemiglauca* low open woodland over **Vachellia farnesiana* scattered tall shrubs over **Cenchrus ciliaris* closed tussock grassland.

Veg Condition Very Poor: high cover of **Cenchrus*.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Abutilon cunninghamii	0.1	10	REL23-20	
Acacia bivenosa	0.1	4	REL23-01	PLDK: sens. lat.
Acacia pyrifolia var. *pyrifolia*	0.1	200	REL22-01=	
Aristida contorta	0.1	30		
Arivela viscosa	0.1	70	REL23-06	
Atalaya hemiglauca	3	500		
Boerhavia coccinea	0.1	15	REL23-04	
**Cenchrus ciliaris*	85	100		NI=1000
Convolvulus clementii	0.1	7	REL23-15	
Corchorus parviflorus	0.1	6	REL22-07=	
Cucumis variabilis	0.1	10	REL23-09	
Eucalyptus victrix	0.1	14		One tree on floodplain.
Euphorbia tannensis subsp. *eremophila*	0.1	20	REL23-10	
Euphorbia trigonosperma	0.1	15	REL23-05	
Gomphrena cunninghamii	0.1	12	REL22-12=	
Gossypium robinsonii	0.1	10		Juvenile.
Hakea lorea subsp. *lorea*	0.1	600	REL23-17	PLDK: sens. lat.
Indigofera monophylla	0.1	150	REL22-10=	
**Malvastrum americanum*	0.1	7		NI=30.
Notoleptopus decaisnei	0.1	12		
Operculina aequisepala	0.1	30		
Polymeria ambigua	0.1	10	REL23-08	
Ptilotus exaltatus	0.1	4		
Ptilotus obovatus var. *obovatus*	0.1	85	REL23-07	
Rhynchosia minima	0.1	50	REL23-12	
Senna artemisioides subsp. *helmsii*	0.1	140	REL23-19	
Senna artemisioides subsp. *oligophylla*	0.1	130	REL23-13	
Sida fibulifera	0.1	500	REL23-18	PLDK: sens. lat.
Solanum lasiophyllum	0.1	60	REL23-16	
Solanum phlomoides	0.1	20	REL23-11	
Sporobolus australasicus	0.1	15		
Swainsona stenodonta	0.1	35	REL23-03	
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	0.1	60	REL22-02=	
Tribulus hirsutus	0.1	10	REL23-02	
Trichodesma zeylanicum var. *zeylanicum*	0.1	12	REL23-14	
Triodia longiceps	0.1	70		More than 1% in places.
**Vachellia farnesiana*	2	350		NI=45.



Marble Bar Rd Upgrade **Site** MBU-REL25

Described by MM **Date** 12-Mar-20 **Type** Relevé 20 x 125 m

MGA Zone 50 802088 mE, 7537616 mN 119.930669°E, -22.240520°S

Habitat Moderate-sized creekline; bed to 8m wide at E end, and banks.

Soil Dark reddish brown (5YR 3/2) clay loam on banks; alluvial sand in bed.

Rock Type Fluvial.

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) open forest over **Vachellia farnesiana* scattered tall shrubs over **Cenchrus setiger,* (**C. ciliaris*) closed tussock grassland with *Triodia longiceps* scattered hummock grasses.

Veg Condition Very Poor: dense **Cenchrus* and several other weed spp. present; grazing evident.

Fire Age No sign of recent fire.

Notes Some very large *Acacia coriacea* subsp. *pendens* trees at E end of relevé.

Species	Cover	Height	Specimen	Notes
Acacia coriacea subsp. *pendens*	3	1200		
**Aerva javanica*	0.1	60		NI=3.
Alysicarpus muelleri	0.1	60		
Amaranthus undulatus	0.1	80		
Ammannia baccifera	0.1	20		
Arivela viscosa	0.1	60		
Atalaya hemiglauca	0.1	500		
Boerhavia burbidgeana	0.1	15	REL25-04	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	30		
Bothriochloa ewartiana	0.1	70	REL25-11	
Bulbostylis barbata	0.1	10	REL25-13	
**Cenchrus ciliaris*	30	70		
**Cenchrus setiger*	55	70		
Convolvulus clementii	0.1	30	REL25-16	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	40	REL25-10	
Corchorus tridens	0.1	40		
Cucumis picrocarpus	0.1	60	REL25-12A	
Cucumis variabilis	0.1	40		Typical form.
Cullen leucanthum	0.1	60		
Cyperus vaginatus	0.1	60		
Dactyloctenium radulans	0.1	8		
**Echinochloa colona*	0.1	30	REL25-12B	
Eragrostis leptocarpa	0.1	50		
Eucalyptus victrix	35	1600		
Euphorbia australis var. *subtomentosa*	0.1	6	REL25-07	Fountain form, grey leaves.
Euphorbia biconvexa	0.1	30	REL25-08	
Indigofera colutea	0.1	30		
Indigofera linifolia	0.1	50		
Indigofera linnaei	0.1	20	REL25-05	
Indigofera trita subsp. *trita*	0.1	40	REL25-06	
**Malvastrum americanum*	0.1	45	NI=300	
Notoleptopus decaisnei	0.1	25		
**Physalis angulata*	0.1	20	REL25-03	NI=1.
Pluchea rubelliflora	0.1	20	REL25-14	
Polymeria ambigua	0.1	25	REL25-13A	
Portulaca oleracea/intraterranea	0.1	6	REL25-09	PLDK: seeds faintly nippled.
Rhynchosia minima	0.1	45		
Sida fibulifera	0.1	35	REL25-01	PLDK: sens. lat.
Sporobolus australasicus	0.1	30	REL25-15	
Streptoglossa bubakii	0.1	15		
Trianthema triquetrum	0.1	15		
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	95	REL25-02	NI=10. PLDK: large flowers (but intrastaminal glands not forming a ring). Det by M Hislop (WAH): some fruit have dimorphic indumentum; others lack the short layer.
Triodia epactia	0.1	40		Sterile.

Species	Cover	Height	Specimen	Notes
Triodia longiceps	0.5	40		
**Vachellia farnesiana*	0.1	220		NI=50.





Marble Bar Rd Upgrade **Site** MBU-REL26

Described by MM **Date** 12-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 50 802172 mE, 7536446 mN 119.931703°E, -22.251061°S

Habitat Small rocky ironstone knoll, elevation 504 m, rising up out of general *Triodia longiceps* plain.

Soil Dark reddish brown clay loam.

Rock Type Robe Pisolite; conglomerate-form ironstone.

Vegetation *Acacia aptaneura* scattered low trees over *Triodia longiceps* open hummock grassland over *Eriachne mucronata* (typical form) very open tussock grassland.

Veg Condition Excellent to Very Good; 1 x **Vachellia*.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon lepidum	0.1	10	REL26-12	PLDK: sens. lat.
Acacia aptaneura	1	320	REL26-01	
Acacia tetragonophylla	0.1	150		
Amaranthus cuspidifolius	0.1	25	REL26-04	
Arivela viscosa	0.1	40	REL26-02	
Boerhavia burbidgeana	0.1	20	REL26-09	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	10		
Cucumis variabilis	0.1	60	REL26-08	
Cynodon prostratus	0.1	4	REL26-06	
Dactyloctenium radulans	0.1	8		
Enneapogon caerulescens	0.1	15		
Enneapogon polyphyllus	0.1	30	REL26-10	PLDK: sens. lat.
Eriachne mucronata (typical form)	8	40	REL26-14	
Eriachne pulchella	0.1	12	REL26-13	Sens lat.
Maireana georgei	0.1	40	REL26-07, -16	PLDK: sens. lat.
Maireana villosa	0.1	40	REL26-03	
Notoleptopus decaisnei	0.1	3		
Paspalidium clementii	0.1	20	REL26-05	
Ptilotus auriculifolius	0.1	15		
Ptilotus exaltatus	0.1	10		
Salsola australis	0.1	15	REL26-11	
Senna glutinosa subsp. *pruinosa*	0.1	110		
Senna notabilis	0.1	10		
Solanum lasiophyllum	0.1	10		
Sporobolus australasicus	0.1	35		
Trianthema triquetrum	0.1	6		
Tribulus hirsutus	0.1	15		
Triodia brizoides	0.1	30	REL26-15	A few plants..
Triodia epactia	0.1	20		Only a couple of plants.
Triodia longiceps	12	40		
Triodia wiseana	0.1	5		A couple of plants.
**Vachellia farnesiana*	0.1	150		NI=1.





Marble Bar Rd Upgrade **Site** MBU-REL27

Described by MM, JK **Date** 13-Mar-20 **Type** Relevé 25 x 100 m

MGA Zone 50 805418 mE, 7524085 mN 119.965520°E, -22.362012°S

Habitat Moderate-sized creekline.

Soil Reddish brown alluvial clay loam.

Rock Type Fluvial.

Vegetation *Eucalyptus victrix* woodland over *Acacia coriacea* subsp. *pendens, Atalaya hemiglauca* scattered low trees over *Acacia tumida* var. *pilbarensis, Acacia pyrifolia* var. *pyrifolia* scattered tall shrubs over *Acacia bivenosa* scattered shrubs over **Cenchrus setiger, (*C. ciliaris*) tussock grassland with *Triodia longiceps* scattered hummock grasses.

Veg Condition Poor: dense weeds, grazing.

Fire Age Burnt 1-2 years ago.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.1	100		
Acacia coriacea subsp. *pendens*	0.5	1000		
Acacia pruinocarpa	0.1	800		
Acacia pyrifolia var. *pyrifolia*	0.5	220		
Acacia tumida var. *pilbarensis*	0.5	250		
Amaranthus undulatus	0.1	90		
Arivela viscosa	0.1	70		
Atalaya hemiglauca	0.5	500		
Boerhavia coccinea	0.1	30		
Capparis lasiantha	0.1	120		
**Cenchrus ciliaris*	15	60		
**Cenchrus setiger*	25	60		
Chrysopogon fallax	0.1	90		
**Citrullus colocynthis*	0.1	5		NI=3. 8cm round, mottled melon fruit.
Corchorus tridens	0.1	20		
Crotalaria medicaginea var. *neglecta*	0.1	20		
Cucumis variabilis	0.1	150		
Dactyloctenium radulans	0.1	5		
Duperreya commixta	0.1	200		
Dysphania rhadinostachya	0.1	30		Sterile.
Eragrostis cumingii	0.1	20		
Eragrostis tenellula	0.1	35		
Eriachne tenuiculmis	0.1	60		
Eucalyptus victrix	15	1200		
Euphorbia australis var. *subtomentosa*	0.1	15	REL27-03	
Euphorbia biconvexa	0.1	40	REL27-01	
Euphorbia boophthona	0.1	20		
Evolvulus alsinoides var. *decumbens*	0.1	35		
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Hybanthus aurantiacus	0.1	30		
Ipomoea polymorpha	0.1	25	REL27-04	
**Malvastrum americanum*	0.1	20		Scattered. NI=50.
Notoleptopus decaisnei	0.1	30		
Paspalidium clementii	0.1	25		
Phyllanthus erwinii	0.1	8		
Phyllanthus maderaspatensis	0.1	30		
Pterocaulon sphacelatum	0.1	3		Seedlings.
Rhynchosia minima	0.1	15		
Senna notabilis	0.1	40		
Solanum lasiophyllum	0.1	50		
Sporobolus australasicus	0.1	40		
Streptoglossa bubakii	0.1	30		
Tephrosia rosea var. *clementii*	0.1	50	REL27-02	
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	0.1	80	REL27-06	
Triodia longiceps	0.5	45		
**Vachellia farnesiana*	0.1	180		NI=5.
Ventilago viminalis	0.1	450	REL27-05	
Waltheria indica	0.1	55		



Marble Bar Rd Upgrade **Site** MBU-REL31

Described by AL,BRM **Date** 14-Mar-20 **Type** Relevé 60 x 40 m

MGA Zone 51 191315 mE, 7516557 mN 120.001335°E, -22.429343°S

Habitat Moderate-sized creekline; quadrat is half stony creek bed and half on banks and island.

Soil Reddish brown (2.5YR 4/4) alluvial loam.

Rock Type Basalt, chert, mudstone.

Vegetation *Eucalyptus victrix* open woodland over *Atalaya hemiglauca* low open woodland over *Acacia pyrifolia* var. *pyrifolia* scattered tall shrubs over *Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) scattered low shrubs over **Cenchrus ciliaris, (*C. setiger*) tussock grassland.

Veg Condition Very Poor: cattle tracks, scats; high cover of **Cenchrus*.

Fire Age No sign of recent fire.

Notes Creek banks are degraded, with 50-60% cover of **Cenchrus* (40% cover over whole relevé).

Species	Cover	Height	Specimen	Notes
Acacia pyrifolia var. *pyrifolia*	2	400		
**Aerva javanica*	0.1	30		NI=1.
Amaranthus undulatus	0.1	60	REL31-01	
Aristida contorta	0.1	30		
Arivela viscosa	1	40		
Atalaya hemiglauca	3	350		
Boerhavia coccinea	0.1	20	REL31-07	
Bothriochloa ewartiana	0.1	140	REL31-08	
**Cenchrus ciliaris*	40	50		
**Cenchrus setiger*	2	50		
**Citrullus colocynthis*	0.1	20	MBU47-51=	NI=5.
Corchorus parviflorus	0.1	50	REL31-06	
Cucumis variabilis	0.1	60		
Cymbopogon ambiguus	0.1	110	REL21-06=	Blue leaf.
Dysphania rhadinostachya	0.1	15	REL31-12	Juvenile; subsp. not determined.
Enneapogon caerulescens	0.1	25		
Eragrostis tenellula	0.1	30	REL31-02	
Eremophila longifolia	0.1	180		
Eucalyptus victrix	6	1300		
Euphorbia biconvexa	0.1	30	REL31-10	
Glycine canescens	0.1	20		
Gossypium robinsonii	0.3	250		
Grevillea wickhamii subsp. *hispidula*	0.1	210		Sterile; subsp. applied from flowering collections.
Hybanthus aurantiacus	0.1	25		
Indigofera monophylla	0.1	80		
Indigofera trita subsp. *trita*	0.1	25	MBU62-06=	
**Malvastrum americanum*	0.1	15		NI=15.
Notoleptopus decaisnei	0.1	30	MBU47-41=	
Operculina aequisepala	0.1	50	REL31-04	
Phyllanthus maderaspatensis	0.1	20		
Pluchea rubelliflora	0.1	20	MBU62-03=	
Ptilotus exaltatus	0.1	20		
Ptilotus obovatus var. *obovatus*	0.1	50		Resprouting.
Rhynchosia minima	0.1	30		
Salsola australis	0.1	20		
Santalum lanceolatum	0.1	250	REL31-13	
Senna artemisioides subsp. *oligophylla*	0.1	50	REL31-11	
Sporobolus australasicus	0.1	30		
Stemodia grossa	0.1	20		
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	1	45	REL31-09	
Trianthema triquetrum	0.1	10		
Trichodesma zeylanicum var. *zeylanicum*	0.1	20		
Triodia longiceps	0.1	60		
**Vachellia farnesiana*	0.1	140		NI=1
Ventilago viminalis	0.1	200	REL31-05	



Appendix 11

Mapping of Vegetation Types

Marble Bar Road Upgrades Vegetation Mapping Descriptions

Vegetation of drainage lines

D1 *Eucalyptus camaldulensis, E. victrix* open forest over *Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* low open woodland over **Cenchrus* spp. tussock grassland.

D2 *Eucalyptus victrix, (Acacia coriacea* subsp. *pendens*) low open woodland over *Triodia longiceps* very open hummock grassland.

D3 *Eucalyptus victrix, (Acacia coriacea* subsp. *pendens*) low woodland over *Acacia trachycarpa* open shrubland over *Eriachne benthamii* open tussock grassland with *Triodia longiceps* very open hummock grassland.

D4 *Eucalyptus victrix, (Acacia coriacea* subsp. *pendens)* woodland over **Cenchrus ciliaris, *C. setiger, (Eriachne tenuiculmis, Chrysopogon fallax)* tussock grassland with *Cyperus vaginatus* scattered sedges.

D5 *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis, (A. trachycarpa*) tall open scrub over *Themeda triandra, Chrysopogon fallax* open tussock grassland with *Triodia epactia, (T. longiceps)* very open hummock grassland.

D6 *Eucalyptus xerothermica* scattered low trees over *Grevillea wickhamii, Acacia ancistrocarpa, A. bivenosa* tall shrubland over **Cenchrus ciliaris, *C. setiger* open tussock grassland.

D7 *Eucalyptus leucophloia* subsp. *leucophloia, (E. xerothermica)* low open woodland over *Acacia colei, Acacia ancistrocarpa, A. bivenosa* tall shrubland over *Triodia longiceps* open hummock grassland.

D8 **Cenchrus ciliaris, *C. setiger* tussock grassland.

Vegetation of cracking clays

C1 *Triodia longiceps, T. epactia* open hummock grassland with patches of mixed herbland and annual grassland. This vegetation unit is equivalent to "Cracking clays of the Chichester and Mungaroona Range" (Priority 1) assemblage of the "Four plant assemblages of the Wona land system" PEC.

Mulga vegetation

M1 *Acacia aptaneura* scattered low trees to low woodland over *Triodia longiceps, T. epactia* hummock grassland.

Vegetation of plains

P1 *Acacia bivenosa* scattered tall shrubs over *Senna symonii* scattered shrubs over *Triodia longiceps* hummock grassland. This vegetation unit is equivalent to "Stony saline plains of the Mosquito land system" PEC (Priority 3).

P2 *Triodia longiceps, (T. wiseana)* hummock grassland.

P3 *Triodia epactia* hummock grassland.

P4 *Acacia trachycarpa* open shrubland over *Triodia epactia, T. longiceps* hummock grassland.

P5 *Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Triodia wiseana, (T. longiceps)* open hummock grassland.

Vegetation Descriptions for Marble Bar Road Upgrades Vegetation Maps

Biota Environmental Sciences

Marble Bar Road Upgrades Vegetation Mapping Descriptions

Vegetation of hills

H1 *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland.

H2 *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland.

H3 *Acacia inaequilatera* tall open shrubland over *Triodia wiseana, T. epactia* hummock grassland.

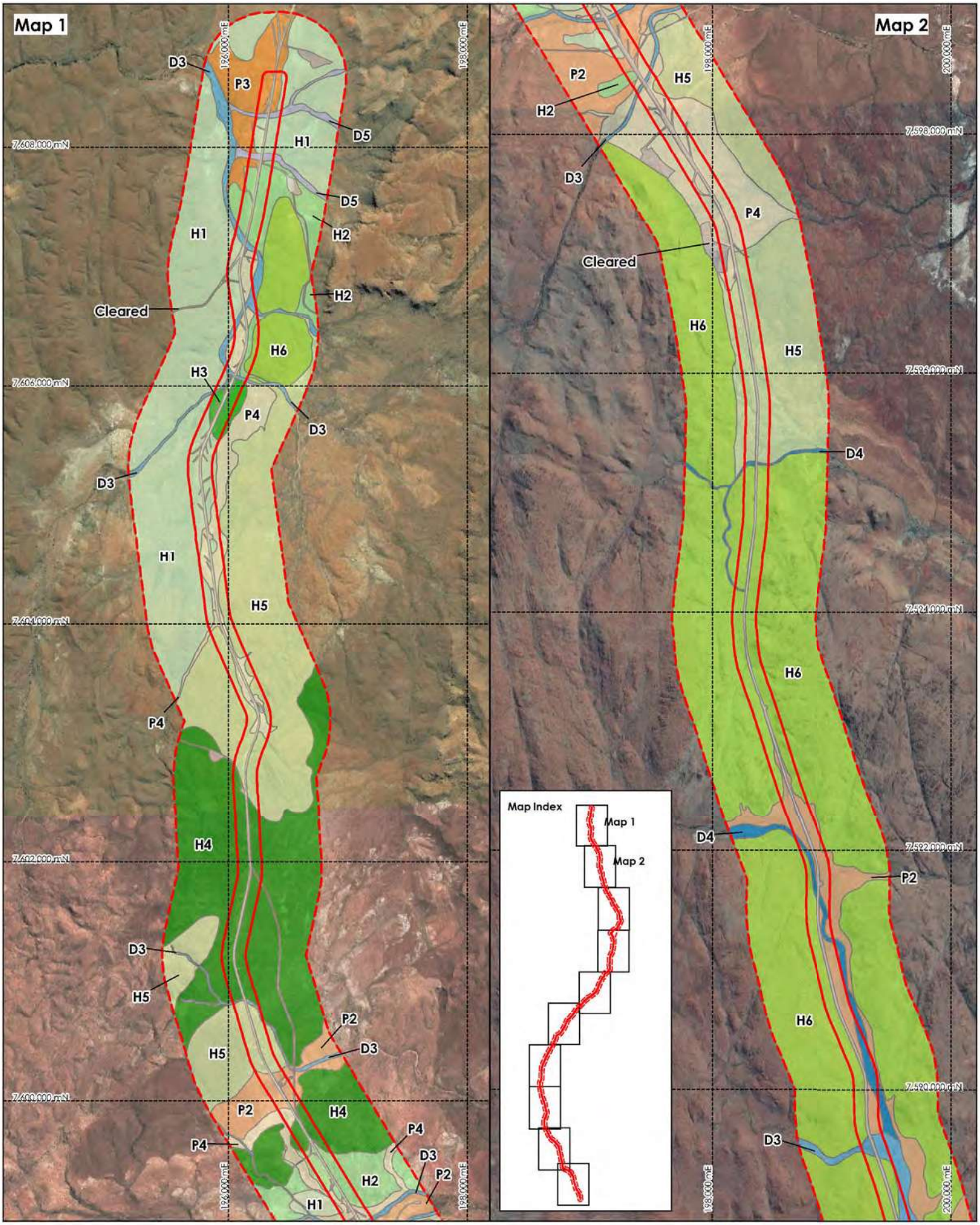
H4 *Triodia epactia* hummock grassland.

H5 *Acacia orthocarpa* open shrubland over *Triodia epactia* hummock grassland.

H6 *Acacia inaequilatera* scattered tall shrubs to tall open shrubland over *Triodia epactia* hummock grassland.

H7 *Triodia wiseana, T. scintillans* hummock grassland.

H8 *Triodia brizoides* hummock grassland.



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

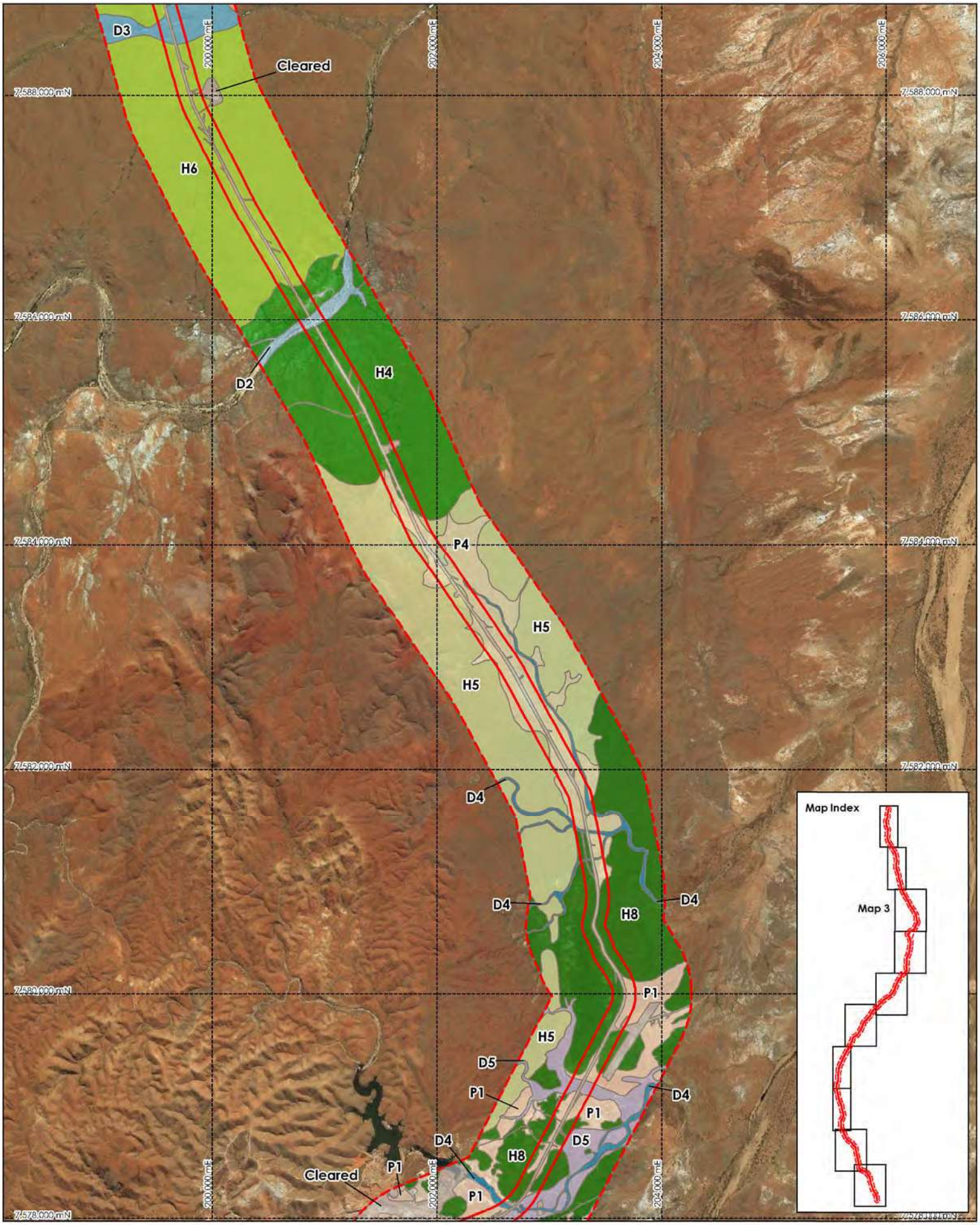
0 1 2

kilometres

Marble Bar Road Upgrade Vegetation Maps 1 & 2

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: 12 Feb 2021 | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

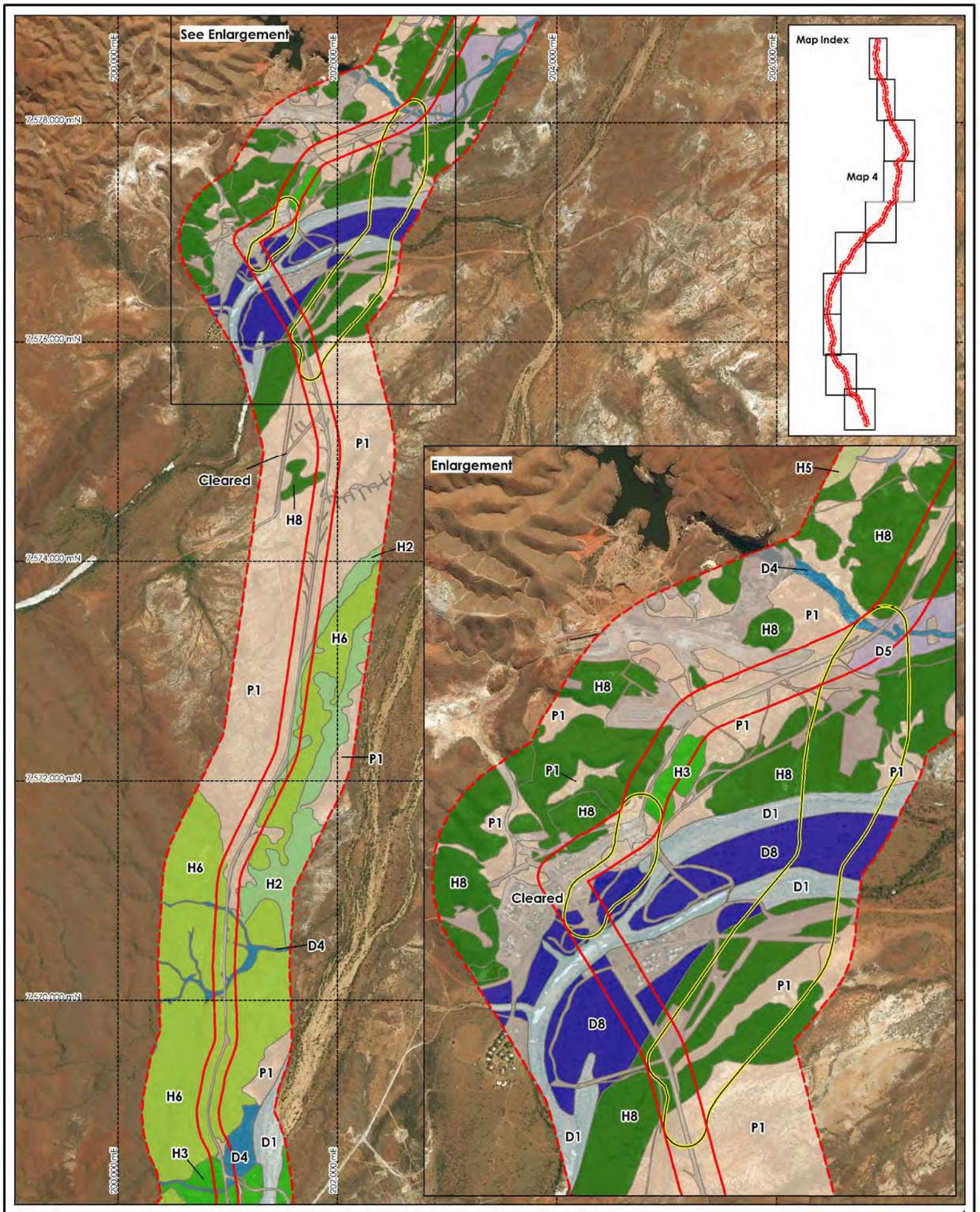
0 1 2

kilometres

Marble Bar Road Upgrade Vegetation Map 3

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Nullagine bypass survey area

N

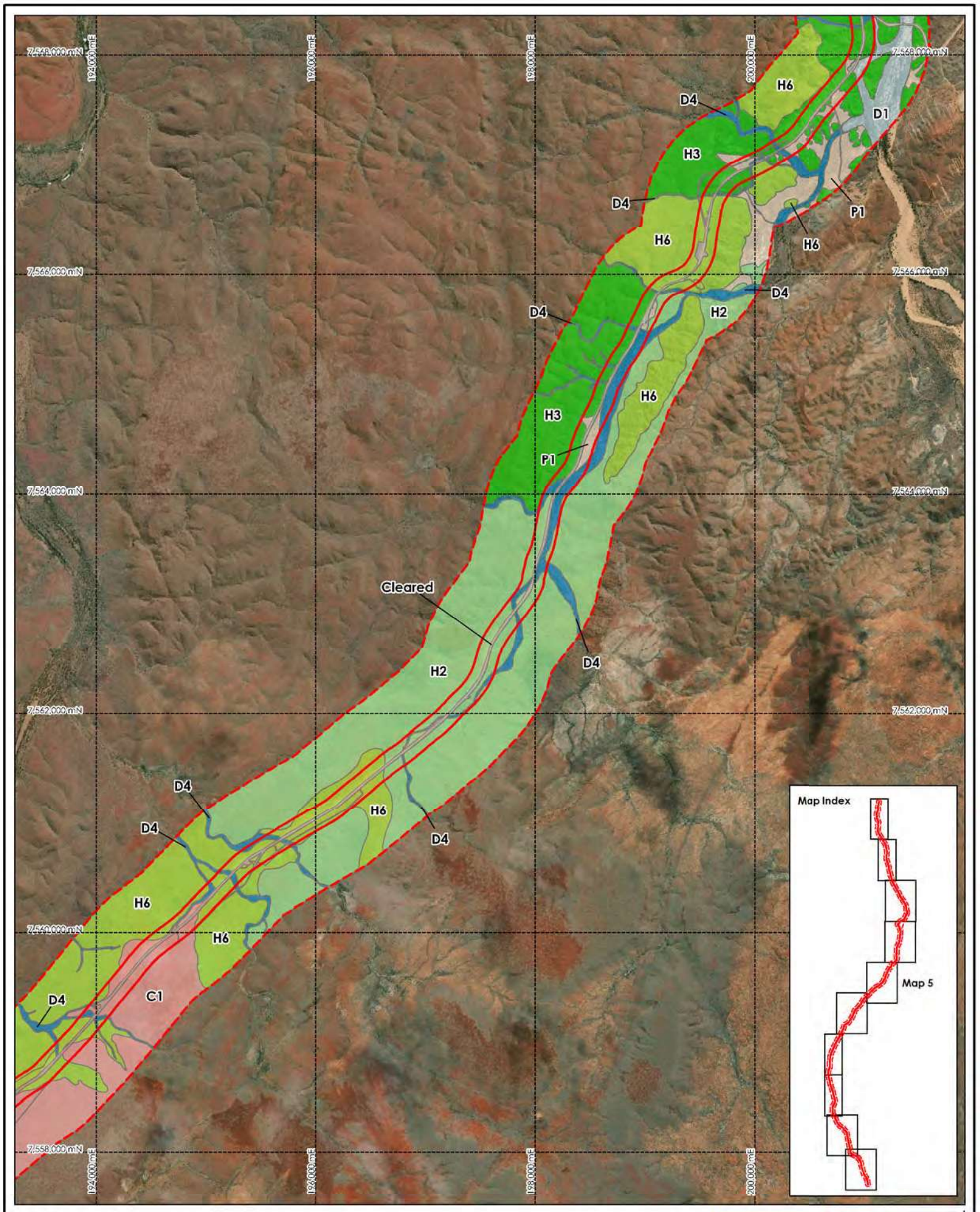
0 1 2

kilometres

Marble Bar Road Upgrade Vegetation Map 4

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

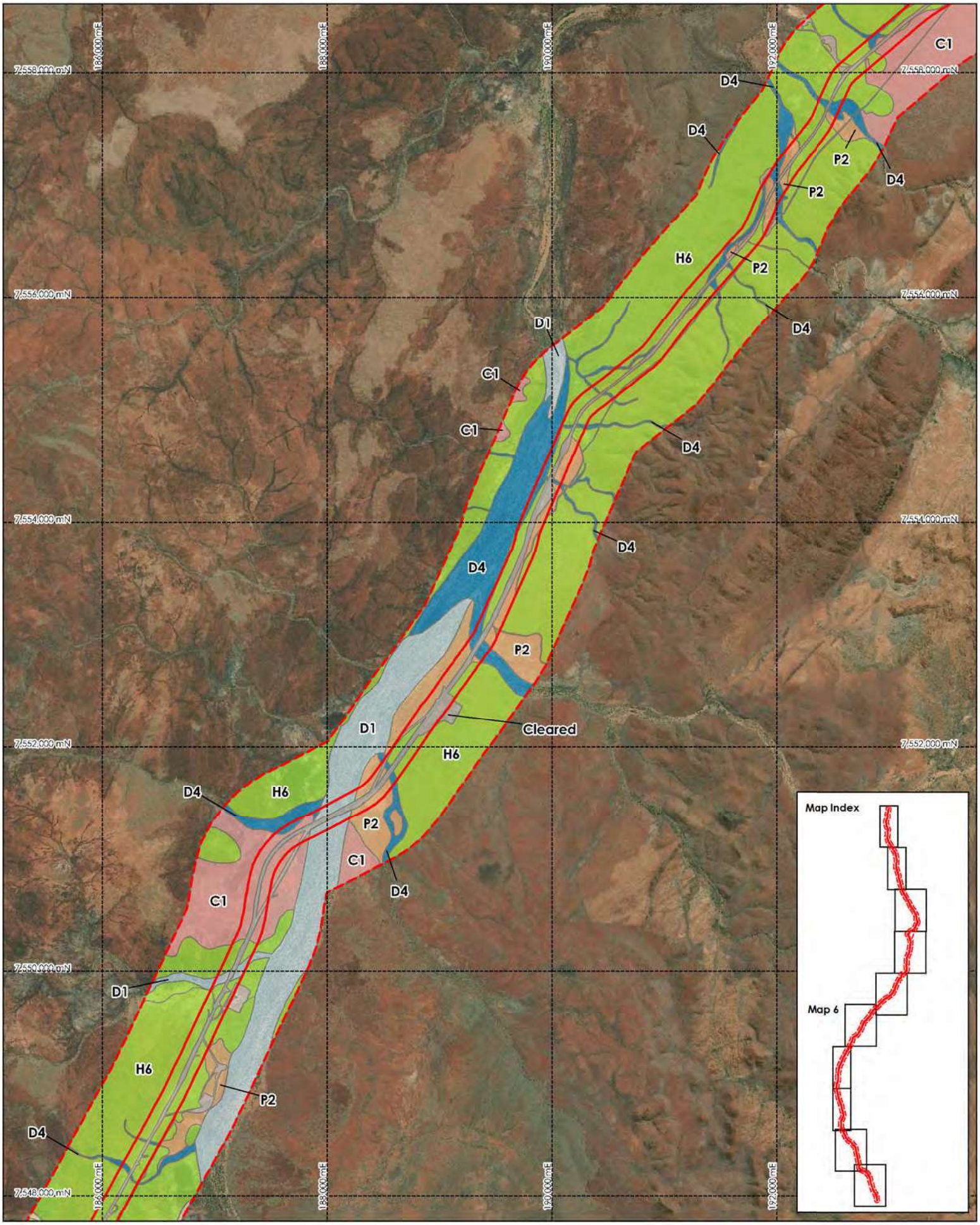
0 1 2

kilometres

Marble Bar Road Upgrade Vegetation Map 5

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map



Survey area

Contextual area

N

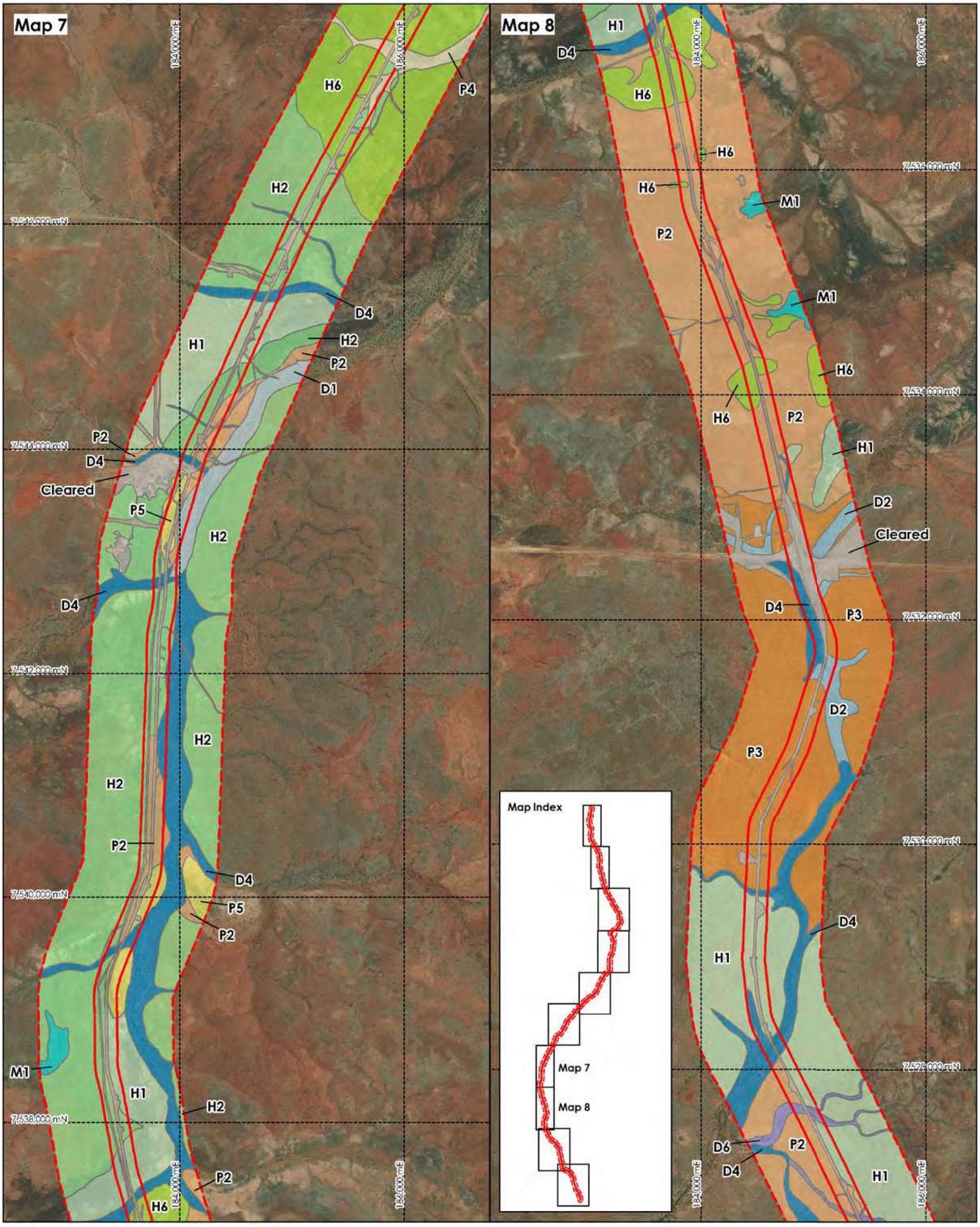
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Map 6

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

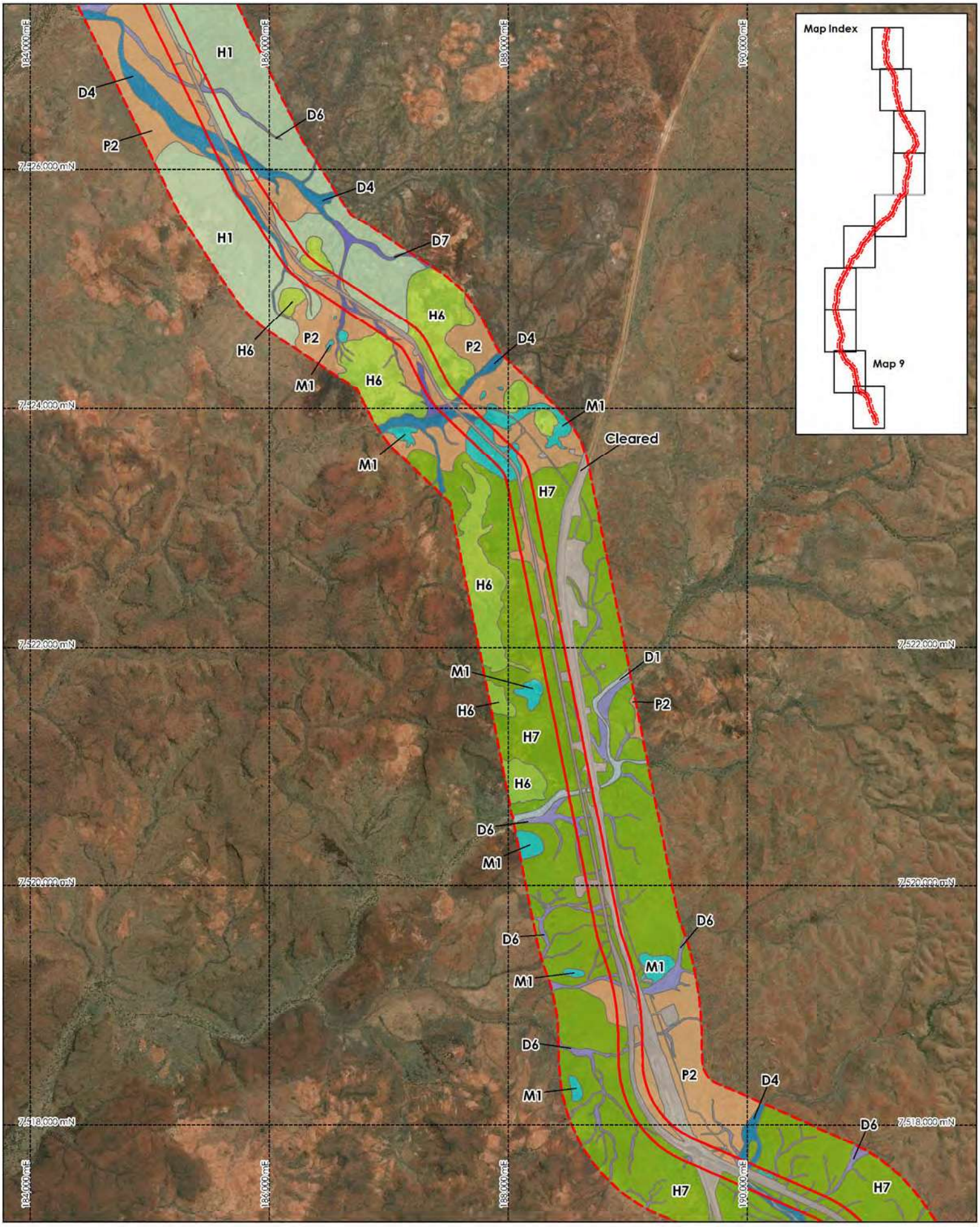
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Maps 7 & 8

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

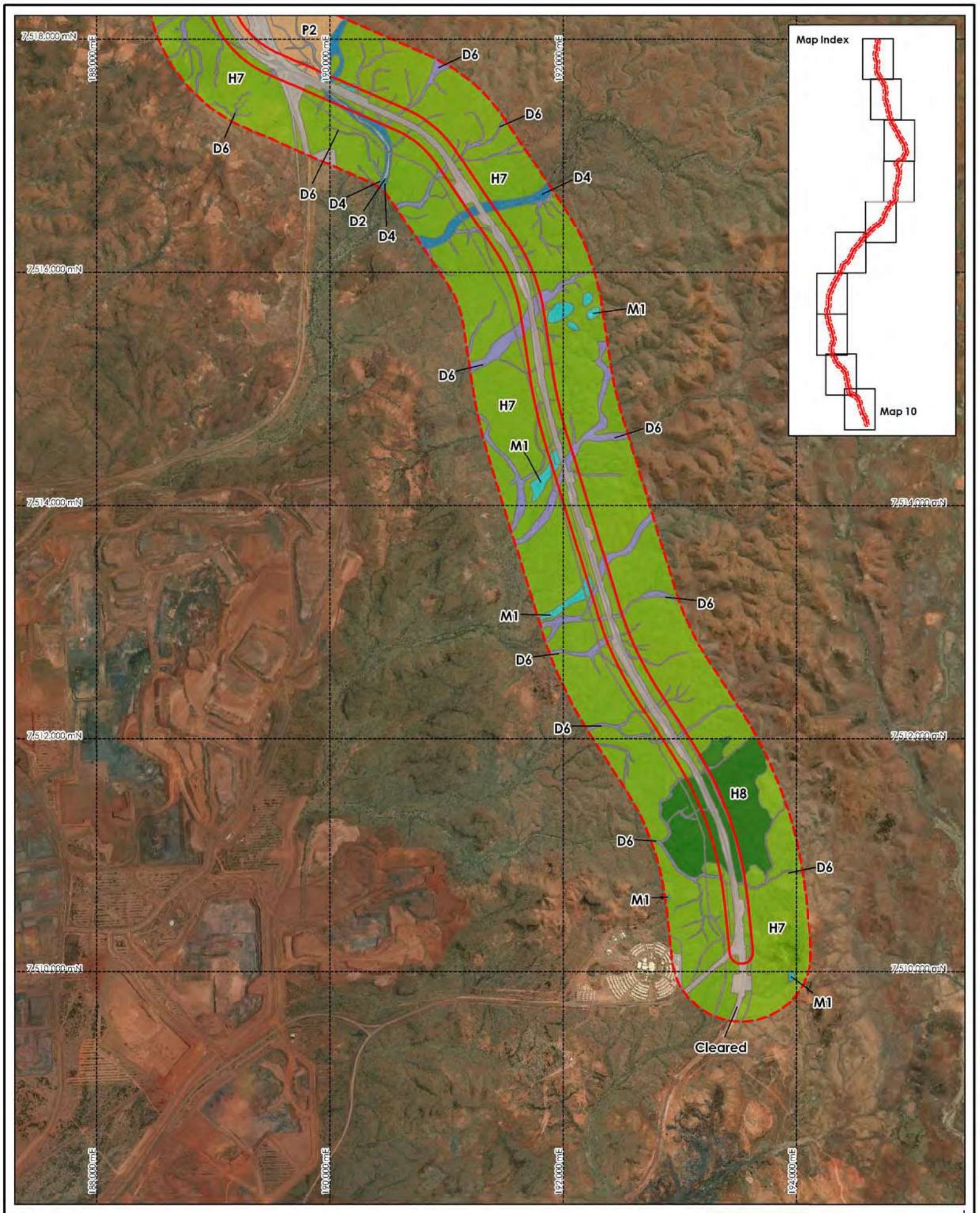
0 1 2

kilometres

Marble Bar Road Upgrade Vegetation Map 9

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

0 1 2

kilometres

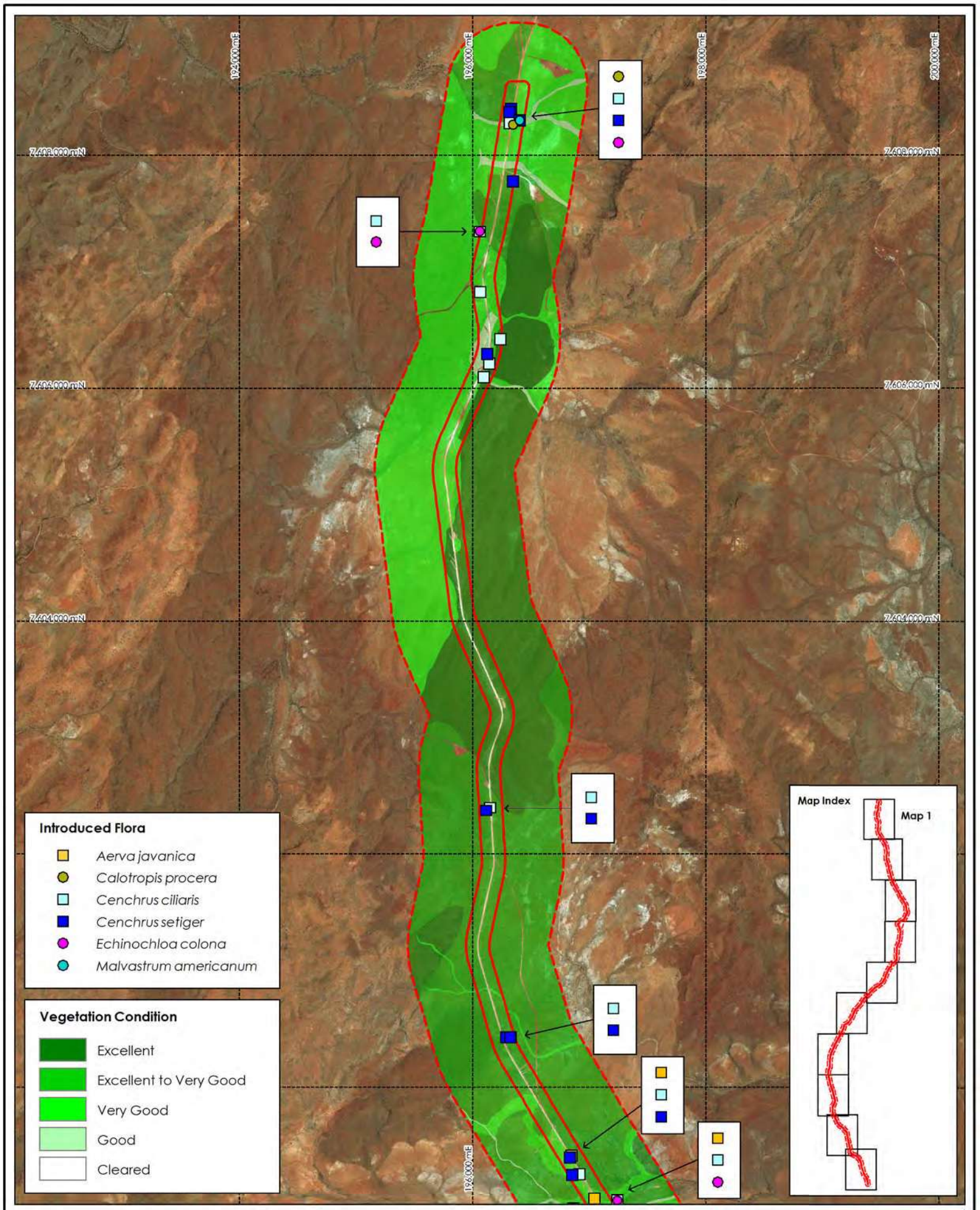
Marble Bar Road Upgrade Vegetation Map 10

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:40,000

Appendix 12

Mapping of Vegetation Condition and Introduced Flora Locations



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

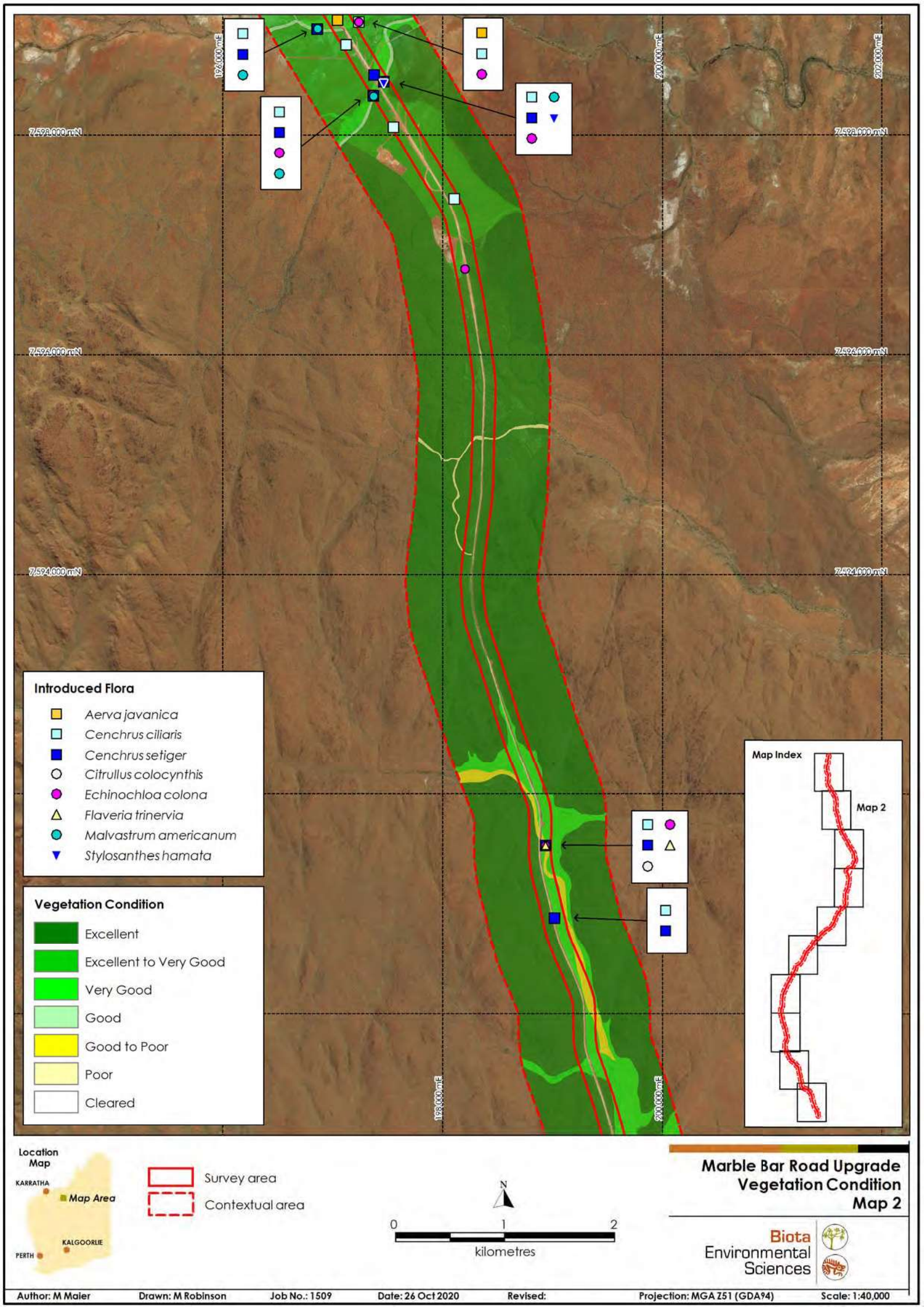
0 1 2

kilometres

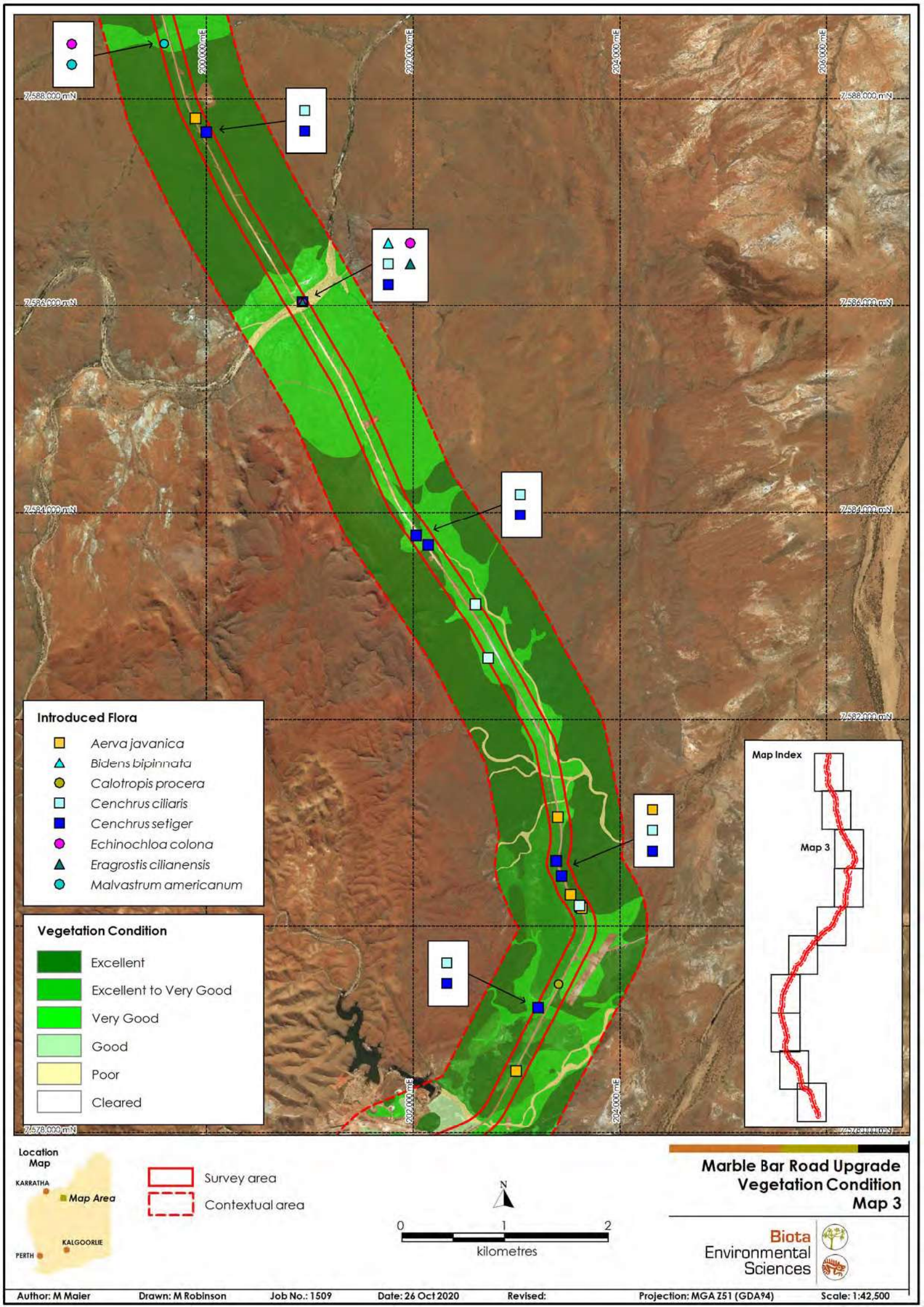
Marble Bar Road Upgrade
Vegetation Condition
Map 1

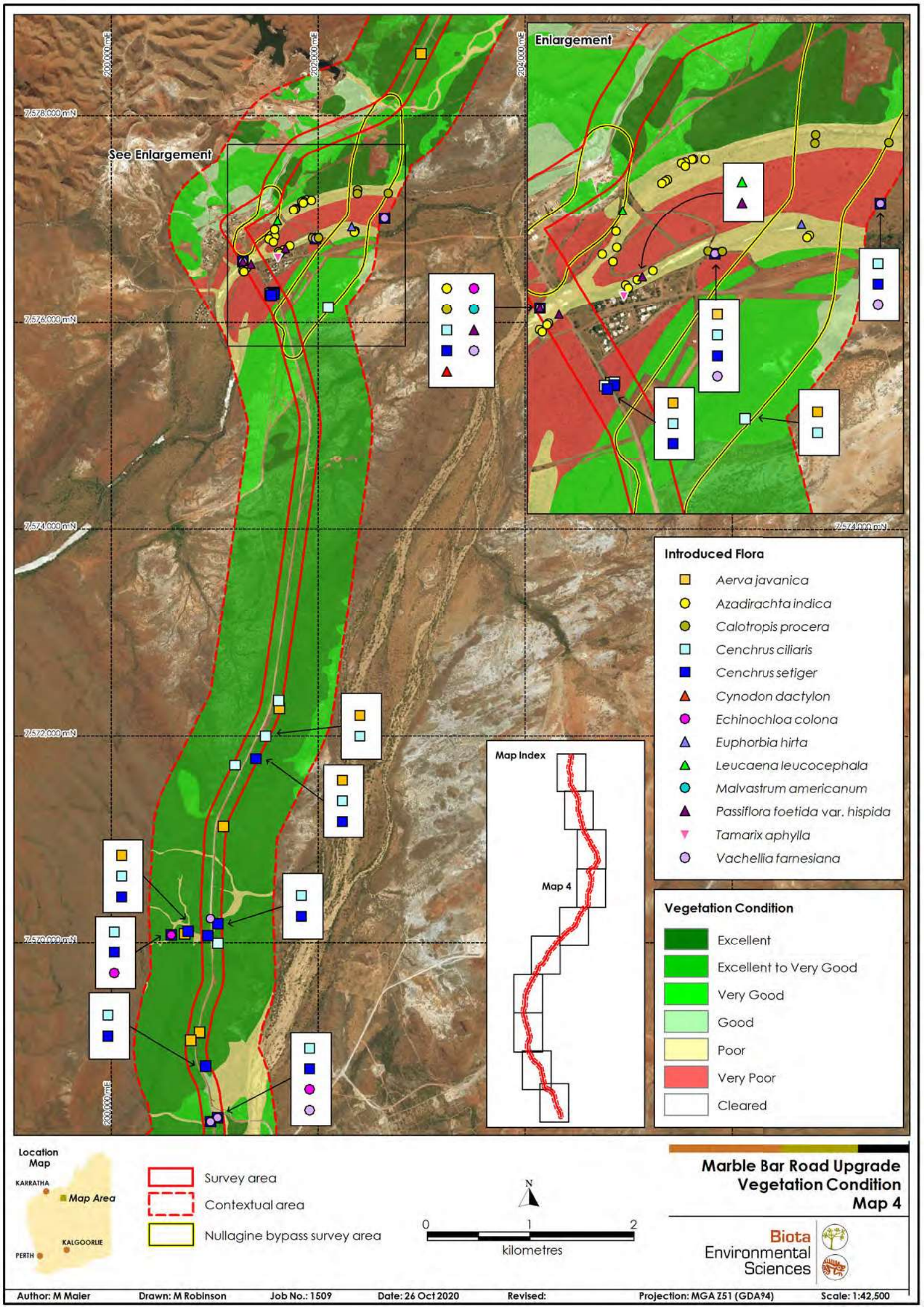
Biota Environmental Sciences

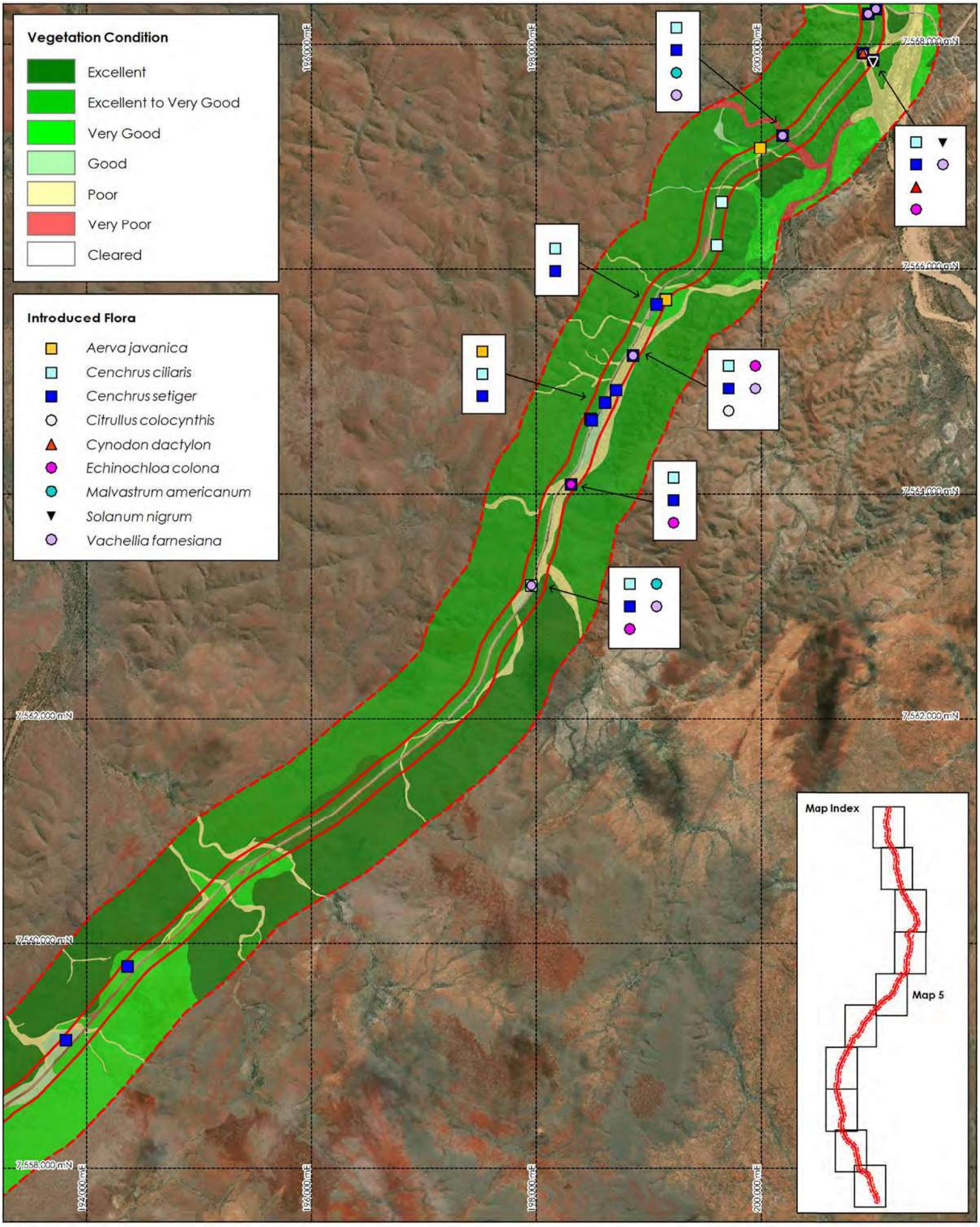
Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: 12 Feb 2021 | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000


200,000 mE
202,000 mE
204,000 mE
206,000 mE
7,588,000 mN
7,586,000 mN
7,584,000 mN
7,582,000 mN
7,578,000 mN
Introduced Flora
Aerva javanica
Bidens bipinnata
Calotropis procera
Cenchrus ciliaris
Cenchrus setiger
Echinochloa colona
Eragrostis cilianensis
Malvastrum americanum
Vegetation Condition
Excellent
Excellent to Very Good
Very Good
Good
Poor
Cleared
Map Index
Map 3
Location Map
KARRATHA
Map Area
KALGOORLIE
PERTH
Survey area
Contextual area
N
0
1
2
kilometres
Marble Bar Road Upgrade
Vegetation Condition
Map 3
Biota Environmental Sciences
Author: M Maier
Drawn: M Robinson
Job No.: 1509
Date: 26 Oct 2020
Revised:
Projection: MGA Z51 (GDA94)
Scale: 1:42,500


Enlargement
See Enlargement
200,000 mE
202,000 mE
204,000 mE
7,578,000 mN
7,576,000 mN
7,574,000 mN
7,572,000 mN
7,570,000 mN
Introduced Flora
Aerva javanica
Azadirachta indica
Calotropis procera
Cenchrus ciliaris
Cenchrus setiger
Cynodon dactylon
Echinochloa colona
Euphorbia hirta
Leucaena leucocephala
Malvastrum americanum
Passiflora foetida var. hispida
Tamarix aphylla
Vachellia farnesiana
Map Index
Map 4
Vegetation Condition
Excellent
Excellent to Very Good
Very Good
Good
Poor
Very Poor
Cleared
Location Map
KARRATHA
Map Area
KALGOORLIE
PERTH
Survey area
Contextual area
Nullagine bypass survey area
N
0
1
2
kilometres
Marble Bar Road Upgrade
Vegetation Condition
Map 4
Biota Environmental Sciences
Author: M Maier
Drawn: M Robinson
Job No.: 1509
Date: 26 Oct 2020
Revised:
Projection: MGA Z51 (GDA94)
Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

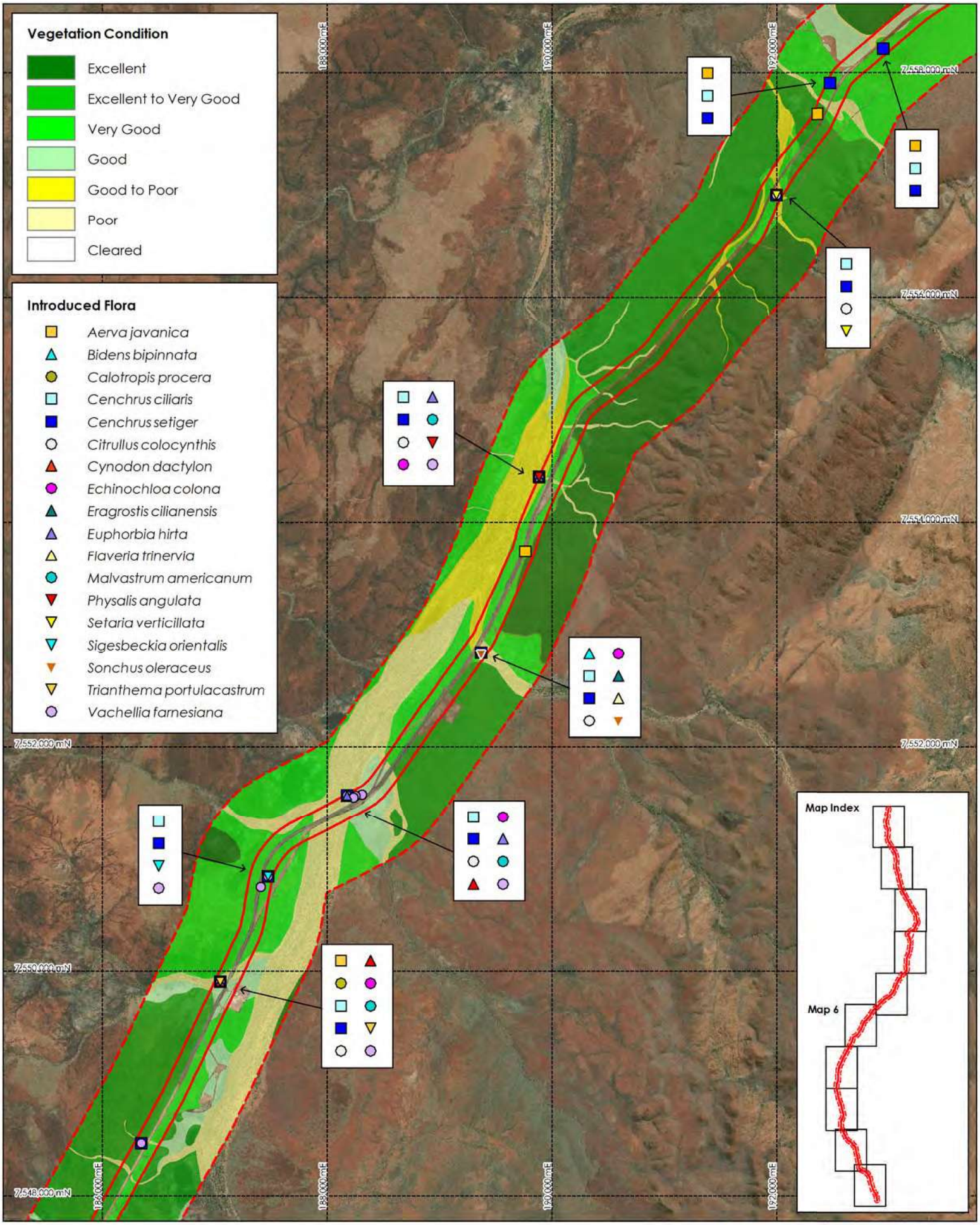
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Condition
Map 5

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

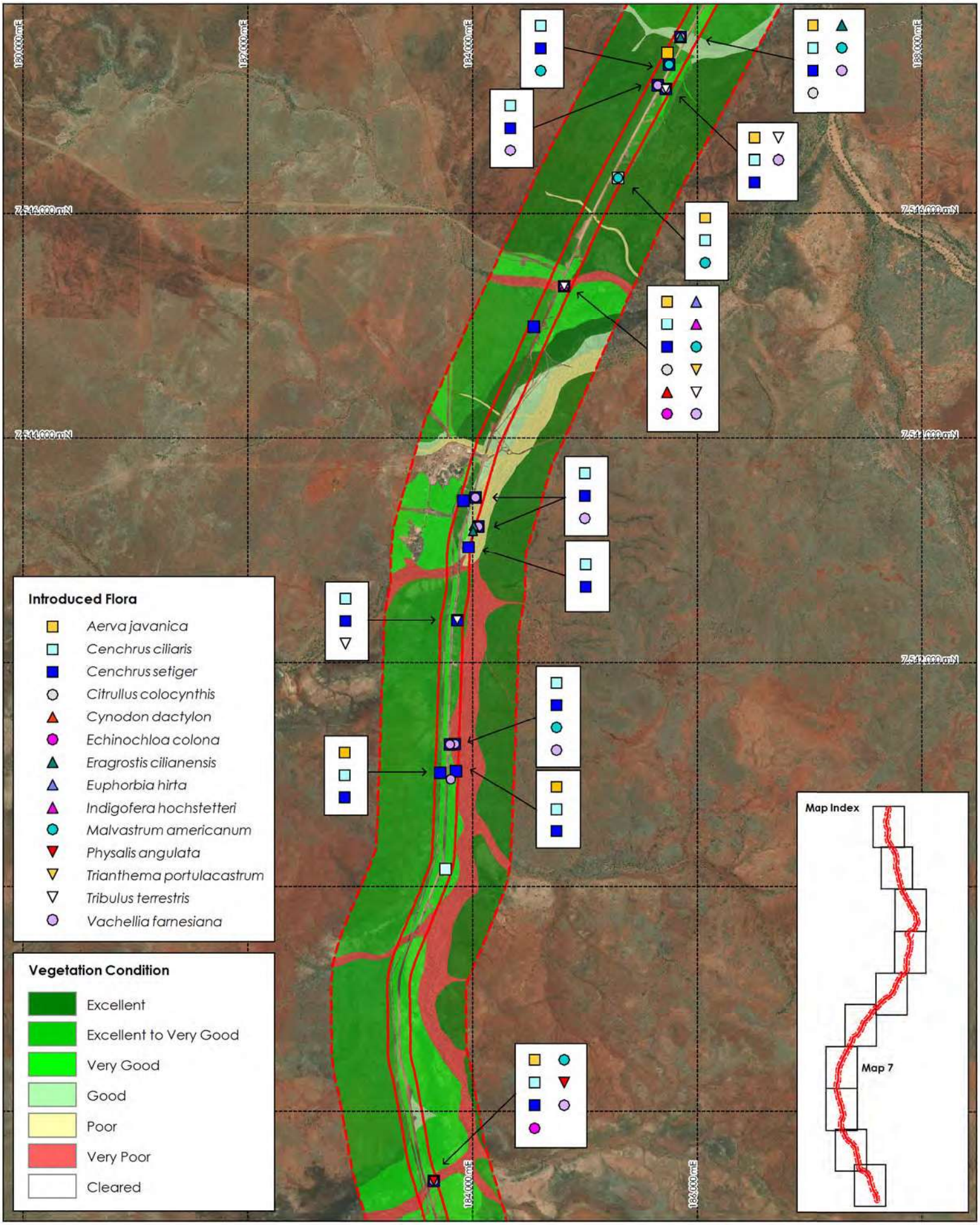
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Condition
Map 6

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map



Survey area

Contextual area

N

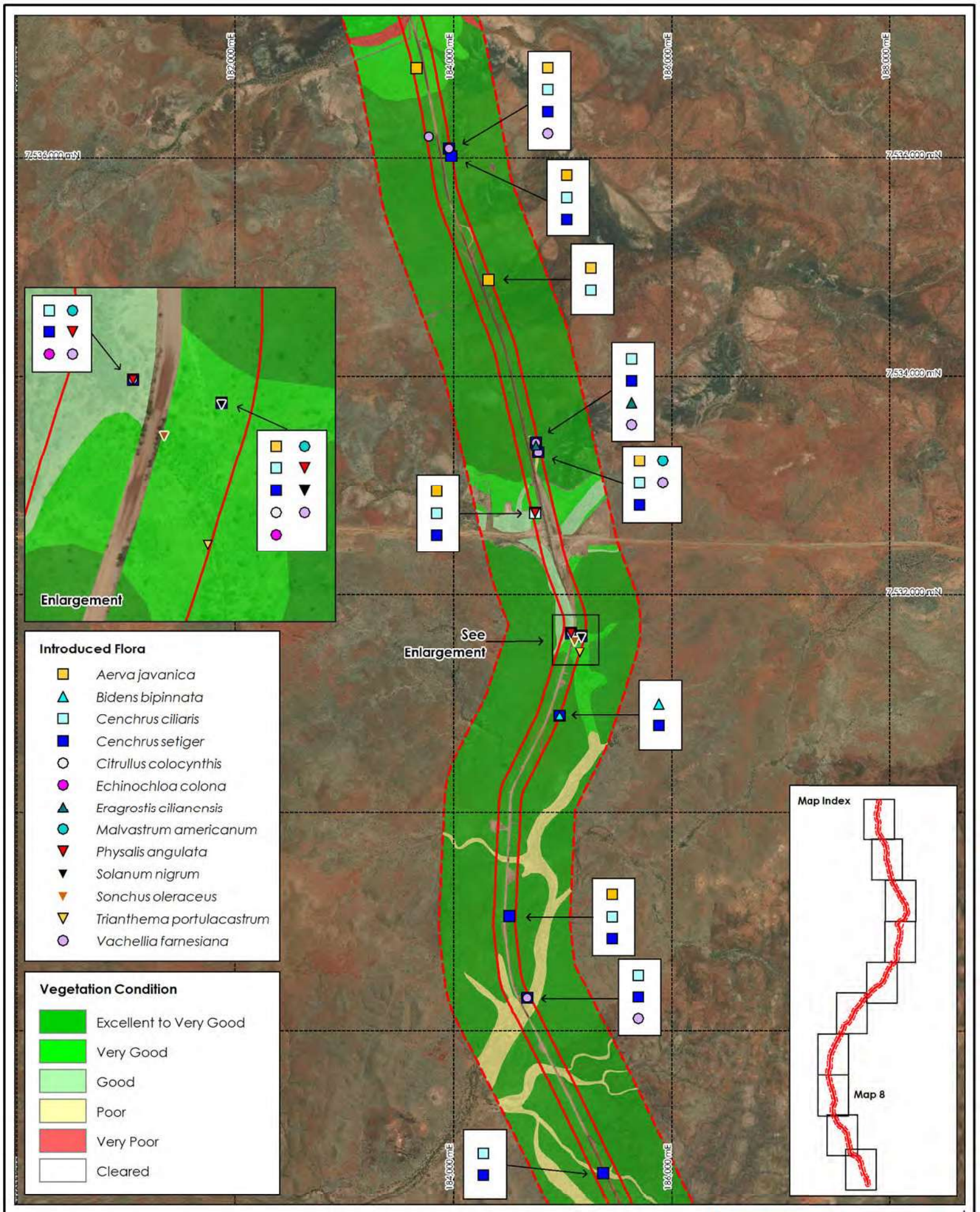
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Condition
Map 7

Biota Environmental Sciences

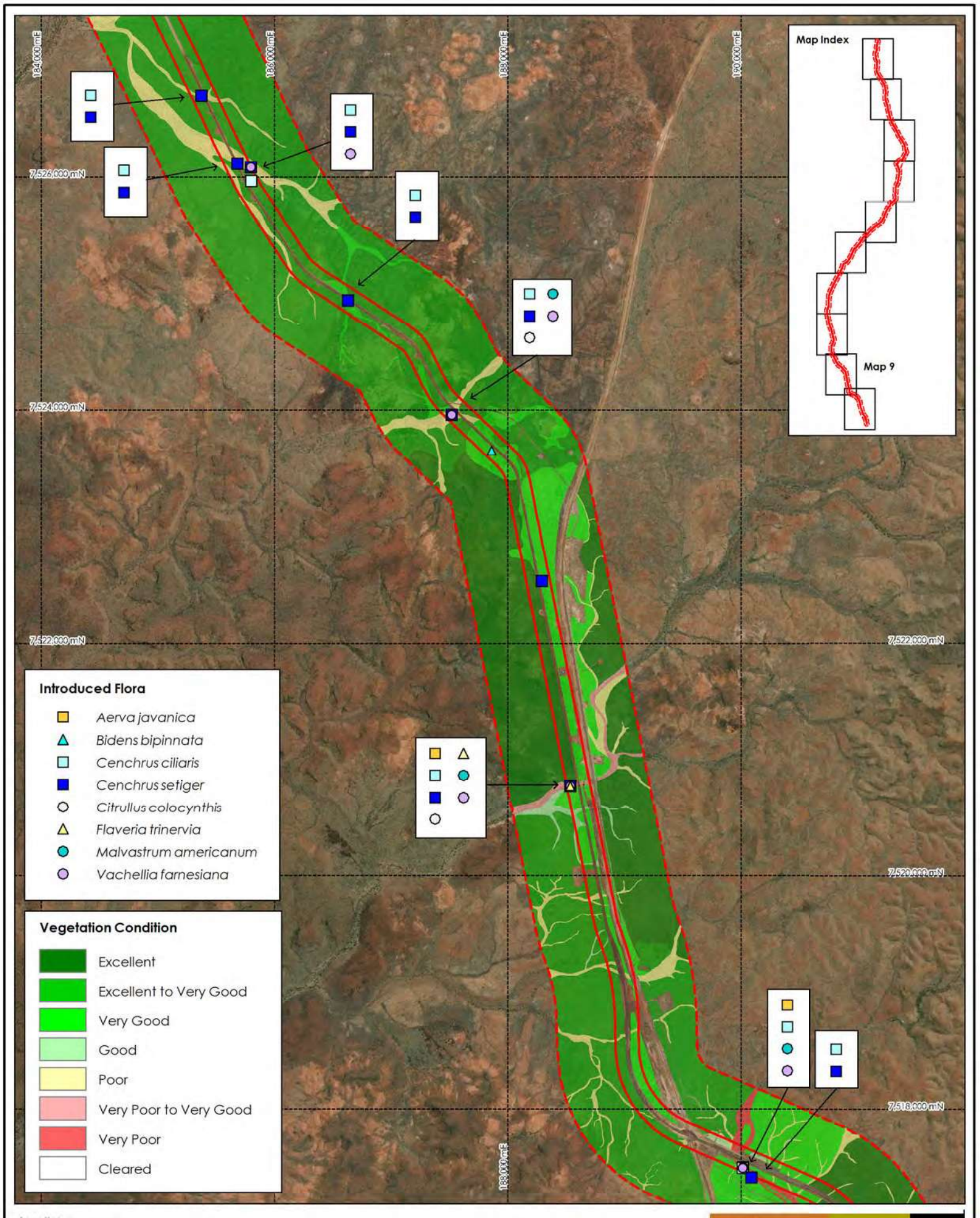
Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 26 Oct 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Marble Bar Road Upgrade
Vegetation Condition
Map 8

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

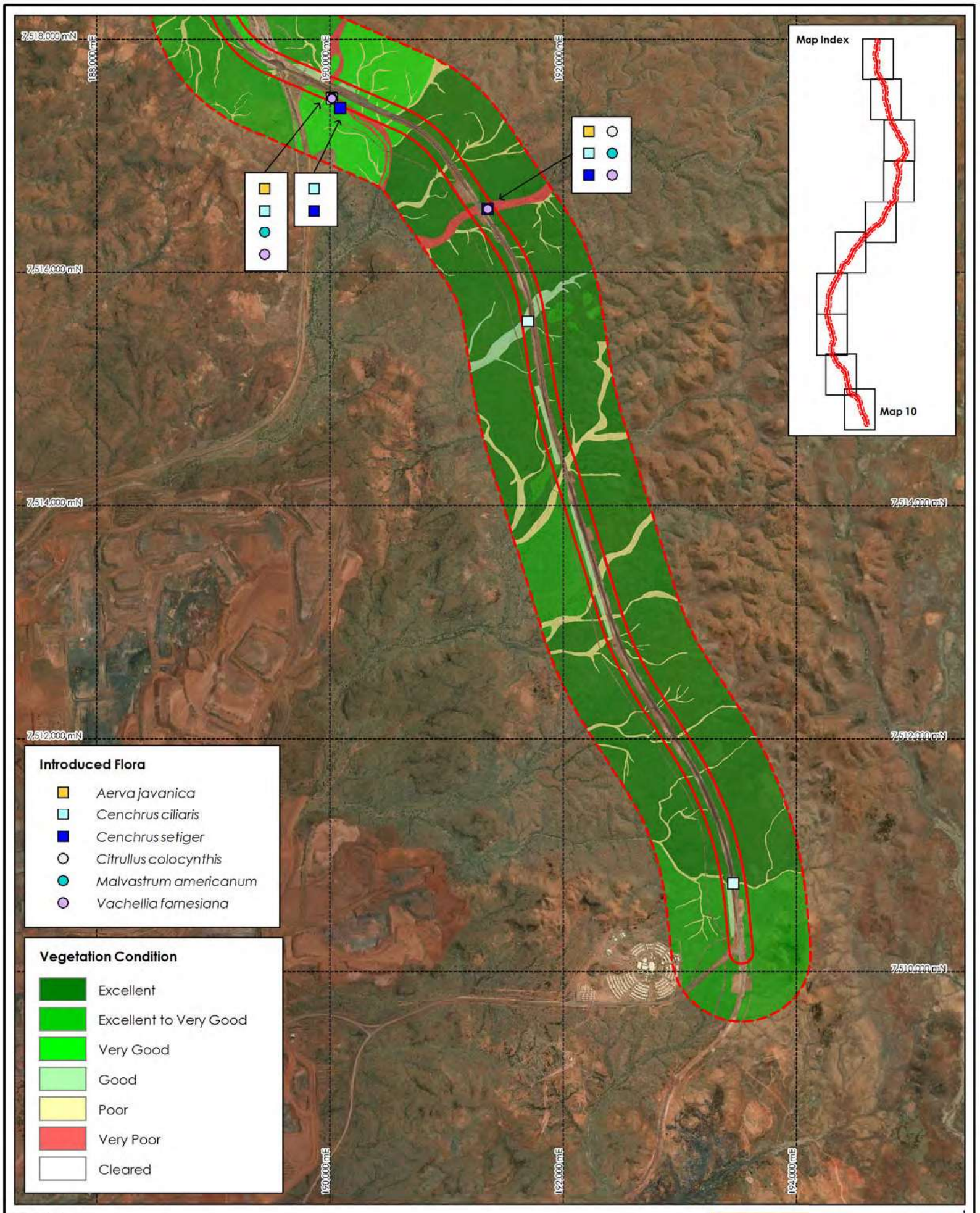
0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Condition
Map 9

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:40,000



Location Map



Survey area

Contextual area

N

0 1 2

kilometres

Marble Bar Road Upgrade
Vegetation Condition
Map 10

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 26 Oct 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:40,000

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Aerva javanica	*	5/3/20	Main survey area	OPP-MM	-21.622405	120.064441	GDA94			occasional.	Biota (this survey)
*Aerva javanica	*	6/3/20	Main survey area	OPP-MM	-21.682807	120.070471	GDA94	10		Scattered on road verge	Biota (this survey)
*Aerva javanica	*	6/3/20	Main survey area	OPP-SC	-21.68618	120.072324	GDA94	50			Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-MM	-21.78803	120.097803	GDA94	10		On road verge, scattered cenchrus both spp all through	Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-MM	-21.849665	120.130419	GDA94	10			Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-SC	-21.853443	120.130208	GDA94	20			Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-MM	-21.85476	120.130685	GDA94	2		on verge.	Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-MM	-21.856417	120.131474	GDA94	10		on road verge.	Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-MM	-21.857498	120.132371	GDA94	200		Patches on road verge.	Biota (this survey)
*Aerva javanica	*	7/3/20	Main survey area	OPP-SC	-21.857581	120.132504	GDA94	50			Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	OPP-MM	-21.871695	120.126081	GDA94	10		on road verge.	Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	OPP-SC	-21.892286	120.11177	GDA94	1000			Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	OPP-SC	-21.89251	120.11163	GDA94	1			Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	OPP-MM	-21.928553	120.111696	GDA94	20		in patch.	Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	OPP-MM	-21.930966	120.110351	GDA94	5			Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	MBU37	-21.932935	120.109402	GDA94	20			Biota (this survey)
*Aerva javanica	*	8/3/20	Main survey area	MBU38	-21.938819	120.106255	GDA94	1			Biota (this survey)
*Aerva javanica	*	15/3/20	Main survey area	OPP-RM	-21.956736	120.103666	GDA94	2			Biota (this survey)
*Aerva javanica	*	15/3/20	Main survey area	OPP-RM	-21.957407	120.102821	GDA94	1			Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	OPP-MM	-21.97513	120.094932	GDA94			scattered all along Telstra optical fibre route.	Biota (this survey)
*Aerva javanica	*	10/3/20	Main survey area	OPP-MM	-21.987122	120.086578	GDA94			scattered near road.	Biota (this survey)
*Aerva javanica	*	10/3/20	Main survey area	MBU-REL03	-21.987176	120.086557	GDA94	1			Biota (this survey)
*Aerva javanica	*	10/3/20	Main survey area	OPP-MM	-21.994327	120.082123	GDA94			scattered.	Biota (this survey)
*Aerva javanica	*	10/3/20	Main survey area	OPP-MM	-21.995321	120.081155	GDA94	15		scattered on verge.	Biota (this survey)
*Aerva javanica	*	10/3/20	Main survey area	OPP-MM	-21.996598	120.07989	GDA94	3		scattered through calcareous habitat.	Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	MBU46	-22.053875	120.025171	GDA94	1			Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	MBU40	-22.056562	120.020535	GDA94	0.1%	MBU40-08		Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	MBU56	-22.059013	120.01937	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	OPP-SC	-22.09369	119.993435	GDA94	1000			Biota (this survey)
*Aerva javanica	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	4			Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	OPP-MM	-22.149904	119.953223	GDA94			very occasional.	Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	OPP-MM	-22.152796	119.953022	GDA94	2			Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	MBU53	-22.159878	119.948732	GDA94	1			Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	OPP-MM	-22.207245	119.933738	GDA94			a few plants.	Biota (this survey)
*Aerva javanica	*	11/3/20	Main survey area	OPP-MM	-22.207351	119.932383	GDA94			occasional along Telstra track.	Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	3			Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	MBU61	-22.245202	119.931077	GDA94	1			Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	OPP-MM	-22.251867	119.933804	GDA94			scattered.	Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	OPP-MM	-22.252541	119.934003	GDA94			scattered on burnt hill.	Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	MBU-REL19	-22.262829	119.937088	GDA94	5			Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	OPP-MM	-22.27716	119.941179	GDA94			scattered.	Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	MBU65	-22.282148	119.940808	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	10			Biota (this survey)
*Aerva javanica	*	13/3/20	Main survey area	MBU63	-22.315454	119.9378	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	14/3/20	Main survey area	MBU-REL22	-22.420675	119.988927	GDA94	3			Biota (this survey)
*Aerva javanica	*	14/3/20	Main survey area	MBU-REL31	-22.429527	120.0017	GDA94	1			Biota (this survey)
*Aerva javanica	*	14/3/20	Nullagine Bypass	MBU79	-21.893668	120.116946	GDA94	2			Biota (this survey)
*Aerva javanica	*	6/3/20	Contextual area	MBU-REL05	-21.686366	120.074194	GDA94	0.1%			Biota (this survey)
*Aerva javanica	*	14/3/20	Contextual area	OPP-MM	-21.887674	120.115887	GDA94			scattered on banks.	Biota (this survey)
*Aerva javanica	*	8/3/20	Contextual area	OPP-MM	-21.948085	120.102449	GDA94	30			Biota (this survey)
*Azadirachta indica	DP	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	1	REL06-20		Biota (this survey)
*Azadirachta indica	DP	14/3/20	Main survey area	OPP-MM	-21.890087	120.109397	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Main survey area	OPP-MM	-21.89015	120.109337	GDA94	2			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Nullagine Bypass	OPP-MM	-21.887089	120.119593	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Nullagine Bypass	OPP-MM	-21.887169	120.119504	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.88424	120.115134	GDA94	4			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884248	120.115075	GDA94	1			Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884266	120.115588	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884342	120.114812	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884376	120.114667	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884487	120.114819	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.884962	120.114104	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.885014	120.114016	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.885094	120.113898	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.886804	120.112074	GDA94	1		dropped pin.	Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.887391	120.112091	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.887615	120.111526	GDA94	1		dropped pin	Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.887893	120.111936	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.888245	120.113477	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.888569	120.11287	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.88875	120.112412	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.88886	120.112516	GDA94	1			Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.890316	120.109044	GDA94	3	MM110		Biota (this survey)
*Azadirachta indica	DP	14/3/20	Contextual area	OPP-MM	-21.89039	120.109149	GDA94	1			Biota (this survey)
*Bidens bipinnata	*	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0.1%	MBU30-39		Biota (this survey)
*Bidens bipinnata	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	0.1%			Biota (this survey)
*Bidens bipinnata	*	13/3/20	Main survey area	MBU66	-22.298958	119.942625	GDA94	50			Biota (this survey)
*Bidens bipinnata	*	13/3/20	Main survey area	MBU-REL20	-22.364774	119.969217	GDA94	0.1%		Sterile.	Biota (this survey)
*Calotropis procera	DP	6/3/20	Main survey area	OPP-MM	-21.602886	120.067239	GDA94	1		Digi 12: 27,28. Single plant at edge of road in creek.	Biota (this survey)
*Calotropis procera	DP	15/3/20	Main survey area	OPP-ALBrM	-21.864211	120.130186	GDA94	1	Opp-BRM03		Biota (this survey)
*Calotropis procera	DP	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	0.1%	REL06-11		Biota (this survey)
*Calotropis procera	DP	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	1	REL16-18	Weed.	Biota (this survey)
*Calotropis procera	DP	14/3/20	Nullagine Bypass	OPP-MM	-21.883439	120.119918	GDA94	1			Biota (this survey)
*Calotropis procera	DP	14/3/20	Nullagine Bypass	OPP-MM	-21.883754	120.119873	GDA94	1			Biota (this survey)
*Calotropis procera	DP	14/3/20	Contextual area	OPP-MM	-21.883777	120.122744	GDA94	1			Biota (this survey)
*Calotropis procera	DP	14/3/20	Contextual area	OPP-MM	-21.883777	120.122744	GDA94	1			Biota (this survey)
*Calotropis procera	DP	14/3/20	Contextual area	OPP-MM	-21.887588	120.115627	GDA94	1			Biota (this survey)
*Calotropis procera	DP	14/3/20	Contextual area	OPP-MM	-21.887598	120.116178	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.601674	120.067099	GDA94	40			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.601924	120.066959	GDA94	50			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU-REL07	-21.602571	120.067795	GDA94	0.1%	REL07-39	Longer bristled form.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU-REL07	-21.602571	120.067795	GDA94	3%			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.602782	120.06698	GDA94	25%			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	MBU-REL04	-21.611157	120.06434	GDA94	0.5%			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	MBU04	-21.615813	120.064265	GDA94	0.1%		Grazed.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU13	-21.619524	120.06586	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.620624	120.064757	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.621384	120.064896	GDA94			occasional.	Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.622405	120.064441	GDA94	25%		grazed.	Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-SC	-21.655746	120.064288	GDA94	100		100+ along roadside	Biota (this survey)
*Cenchrus ciliaris	*	5/3/20	Main survey area	OPP-MM	-21.655974	120.063936	GDA94			very scattered near road.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-SC	-21.673596	120.065616	GDA94	30			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-MM	-21.68295	120.070352	GDA94			scattered all along road verge through here.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-SC	-21.684263	120.071117	GDA94	50		Roadside strip 5m	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-MM	-21.684315	120.070498	GDA94	1%			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU21	-21.688232	120.073017	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-MM	-21.690739	120.075448	GDA94			scattered all along road verges.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU-REL08	-21.691322	120.076257	GDA94	100		NI=100+.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	OPP-MM	-21.692443	120.075327	GDA94			scattered tussocks to open tussock grassland on edges of creek.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU10	-21.695055	120.077051	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU22	-21.701032	120.082262	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Main survey area	MBU-REL09	-21.754338	120.089215	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-MM	-21.76027	120.089868	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-MM	-21.789231	120.098813	GDA94	1%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-MM	-21.82481	120.117691	GDA94	2.5%			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-MM	-21.825659	120.118766	GDA94	25%			Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU32	-21.830871	120.123109	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	MBU34	-21.83561	120.124174	GDA94	25			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-SC	-21.853461	120.130189	GDA94	200			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-MM	-21.85476	120.130685	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	OPP-SC	-21.85737	120.132286	GDA94	100			Biota (this survey)
*Cenchrus ciliaris	*	7/3/20	Main survey area	MBU35	-21.866245	120.12826	GDA94	30			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	25%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.892262	120.111916	GDA94	50%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-SC	-21.892381	120.111527	GDA94	1000			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-SC	-21.89251	120.11163	GDA94			all along roadside and drainage through here.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU45	-21.927874	120.111613	GDA94	30			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.930966	120.110351	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.930966	120.110351	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU37	-21.932935	120.109402	GDA94	20			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU43	-21.933451	120.107428	GDA94	0.1%		In disturbed area.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU-REL12	-21.947282	120.105542	GDA94	17%	REL12-12	Includes longer bristled form.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.948294	120.104583	GDA94	15%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU44	-21.949006	120.105536	GDA94	0.1%		A few plants; 2 forms, typical and long-bristled.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU39	-21.959669	120.104149	GDA94	30			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.964164	120.105171	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.964522	120.104505	GDA94	20%		grazed "lawn".	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	OPP-MM	-21.96769	120.103986	GDA94			scattered.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	15%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	MBU-REL02	-21.974136	120.096868	GDA94	25%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	MBU-REL11	-21.979403	120.091526	GDA94	50			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.982896	120.091029	GDA94			scattered.	Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.987505	120.085767	GDA94			scattered.	Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	MBU-REL17	-21.991593	120.08366	GDA94	30%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.994327	120.082123	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.995321	120.081155	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.996598	120.07989	GDA94			scattered through calcareous habitat.	Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-21.996717	120.080003	GDA94	40%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	MBU-REL18	-22.001829	120.078108	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	10/3/20	Main survey area	OPP-MM	-22.009924	120.074535	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU46	-22.053875	120.025171	GDA94	100			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU40	-22.056562	120.020535	GDA94	50			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU-REL14	-22.065445	120.015691	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	10			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU52	-22.119431	119.97076	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	1000		16% cover.	Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	0.1%	MBU47-43	Longer bristled form.	Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	25%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.15085	119.953321	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.152493	119.952318	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.152796	119.953022	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	MBU53	-22.159878	119.948732	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	35%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.185328	119.935899	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.18932	119.935236	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	MBU57	-22.195135	119.934106	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.20508	119.933683	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.205096	119.933267	GDA94	5%		5% cover here, still dense in creek proper.	Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.207245	119.933738	GDA94			scattered.	Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Main survey area	OPP-MM	-22.207351	119.932383	GDA94			occasional along Telstra track.	Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	MBU50	-22.215171	119.932682	GDA94	50			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	30%			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	OPP-MM	-22.251867	119.933804	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	OPP-MM	-22.252541	119.934003	GDA94			scattered on burnt hill.	Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Cenchrus ciliaris	*	12/3/20	Main survey area	MBU-REL19	-22.262829	119.937088	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	OPP-MM	-22.276323	119.940996	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	OPP-MM	-22.27716	119.941179	GDA94			abundant.	Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	MBU65	-22.282148	119.940808	GDA94	0.5%			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94	15%			Biota (this survey)
*Cenchrus ciliaris	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	2%			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	MBU63	-22.315454	119.9378	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-MM	-22.322224	119.939222	GDA94	40%			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-MM	-22.336837	119.945661	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-MM	-22.342164	119.948538	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-MM	-22.34246	119.94964	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	MBU64	-22.343516	119.949653	GDA94	1			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-MM	-22.352957	119.957517	GDA94			dense near road.	Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	15%			Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	13%			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Main survey area	MBU-REL22	-22.420675	119.988927	GDA94	2			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Main survey area	MBU-REL23	-22.420739	119.988899	GDA94	1000		85% cover.	Biota (this survey)
*Cenchrus ciliaris	*	13/3/20	Main survey area	OPP-AL	-22.421484	119.989595	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Main survey area	MBU-REL31	-22.429527	120.0017	GDA94	40%			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Main survey area	OPP-AL	-22.438295	120.004851	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Main survey area	OPP-AL	-22.482177	120.021019	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Nullagine Bypass	MBU79	-21.893668	120.116946	GDA94	50		Under dead Acacia inaequilatera.	Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Contextual area	MBU-REL05	-21.686366	120.074194	GDA94	0.1%			Biota (this survey)
*Cenchrus ciliaris	*	6/3/20	Contextual area	OPP-SC	-21.686888	120.070514	GDA94	1000		Thousands along cattle grazed creek	Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Contextual area	OPP-AL	-21.885991	120.122362	GDA94	20%			Biota (this survey)
*Cenchrus ciliaris	*	14/3/20	Contextual area	OPP-MM	-21.887674	120.115887	GDA94			dense on banks.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Contextual area	OPP-MM	-21.947865	120.102763	GDA94	15%		along creek.	Biota (this survey)
*Cenchrus ciliaris	*	8/3/20	Contextual area	OPP-MM	-21.948171	120.10117	GDA94	10%			Biota (this survey)
*Cenchrus ciliaris	*	11/3/20	Contextual area	OPP-MM	-22.187644	119.936093	GDA94			boundary of EvVfCENspp to W, Ec massive trees along edge of sandy creek bed to E.	Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	OPP-MM	-21.601674	120.067099	GDA94	15			Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	OPP-MM	-21.601924	120.066968	GDA94	30			Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	MBU-REL07	-21.602571	120.067795	GDA94	2%			Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	OPP-MM	-21.602782	120.06698	GDA94	25%			Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	MBU14	-21.607298	120.067169	GDA94	3			Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	OPP-MM	-21.620624	120.064757	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus setiger	*	5/3/20	Main survey area	OPP-MM	-21.655974	120.063936	GDA94			very scattered near road.	Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-MM	-21.67359	120.065259	GDA94	30			Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-SC	-21.673596	120.065597	GDA94	30			Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-MM	-21.68295	120.070352	GDA94			scattered all along road verge through here.	Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-MM	-21.684315	120.070498	GDA94	1%			Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-MM	-21.690739	120.075448	GDA94			scattered all along road verges	Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	MBU-REL08	-21.691322	120.076257	GDA94	100		NI=100+.	Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	OPP-MM	-21.692425	120.075318	GDA94			scattered tussocks to open tussock grassland on edges of creek.	Biota (this survey)
*Cenchrus setiger	*	6/3/20	Main survey area	MBU-REL09	-21.754338	120.089215	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-MM	-21.76027	120.089868	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-MM	-21.789231	120.098813	GDA94	1%			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0.1%	MBU30-05	Dark heads.	Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-MM	-21.82481	120.117691	GDA94	2.5%			Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-MM	-21.825659	120.118766	GDA94	25%			Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-SC	-21.853452	120.130198	GDA94	200			Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	OPP-MM	-21.85476	120.130685	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus setiger	*	7/3/20	Main survey area	MBU35	-21.866245	120.12826	GDA94	2			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	30%			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-SC	-21.89237	120.111894	GDA94				Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-SC	-21.89251	120.11163	GDA94			all along roadside and drainage through here.	Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU37	-21.932935	120.109402	GDA94	5			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU-REL12	-21.947282	120.105542	GDA94	15%			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-MM	-21.948294	120.104583	GDA94	5%			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU39	-21.959669	120.104149	GDA94	50			Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-MM	-21.964164	120.105171	GDA94	20%			Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-MM	-21.964522	120.104505	GDA94	20%		grazed "lawn".	Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	OPP-MM	-21.96769	120.103986	GDA94			scattered.	Biota (this survey)
*Cenchrus setiger	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	30%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	MBU-REL02	-21.974136	120.096868	GDA94	25%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-21.987505	120.085767	GDA94			scattered.	Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	MBU-REL17	-21.991593	120.08366	GDA94	5%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-21.994327	120.082123	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-21.995321	120.081155	GDA94			scattered on verge.	Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-21.996598	120.07989	GDA94			scattered through calcareous habitat.	Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-21.996717	120.080003	GDA94	40%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	MBU-REL18	-22.001829	120.078108	GDA94	8%			Biota (this survey)
*Cenchrus setiger	*	10/3/20	Main survey area	OPP-MM	-22.009924	120.074535	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU55	-22.039858	120.039124	GDA94	0.1%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	OPP-RW	-22.045735	120.033696	GDA94	30			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU46	-22.053875	120.025171	GDA94	0.1%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU40	-22.056562	120.020535	GDA94	5			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU-REL14	-22.065445	120.015691	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	1000		20% cover.	Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	30%			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU52	-22.119431	119.97076	GDA94	30			Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	1000		16% cover.	Biota (this survey)
*Cenchrus setiger	*	9/3/20	Main survey area	OPP-RW	-22.140631	119.959366	GDA94	1000			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	4%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.15085	119.953321	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.152493	119.952318	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.152796	119.953022	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	35%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	MBU48	-22.171738	119.941218	GDA94	4			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.185328	119.935899	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	MBU49	-22.185545	119.934838	GDA94	0.1%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.18932	119.935236	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	MBU57	-22.195135	119.934106	GDA94	0.1%		Fruiting.	Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.20508	119.933683	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.205096	119.933267	GDA94	5%		5% cover here, still dense in creek proper.	Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.207245	119.933738	GDA94			scattered.	Biota (this survey)
*Cenchrus setiger	*	11/3/20	Main survey area	OPP-MM	-22.207351	119.932383	GDA94			occasional along Telstra track.	Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	55%			Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	OPP-MM	-22.251867	119.933804	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	OPP-MM	-22.252541	119.934003	GDA94			scattered on burnt hill.	Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	OPP-MM	-22.276323	119.940996	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	OPP-MM	-22.27716	119.941179	GDA94			abundant.	Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94	15%			Biota (this survey)
*Cenchrus setiger	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.5%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	MBU66	-22.298958	119.942625	GDA94	10			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	MBU63	-22.315454	119.9378	GDA94	0.1%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-MM	-22.322224	119.939222	GDA94	40%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-MM	-22.336837	119.945661	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-MM	-22.342164	119.948538	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-MM	-22.34246	119.94964	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-MM	-22.352957	119.957517	GDA94			dense near road.	Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	25%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	MBU69	-22.374954	119.973169	GDA94	1			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	0.1%			Biota (this survey)
*Cenchrus setiger	*	13/3/20	Main survey area	OPP-AL	-22.421484	119.989595	GDA94	20%		in creek.	Biota (this survey)
*Cenchrus setiger	*	14/3/20	Main survey area	MBU-REL31	-22.429527	120.0017	GDA94	2%			Biota (this survey)
*Cenchrus setiger	*	6/3/20	Contextual area	OPP-SC	-21.686888	120.070533	GDA94	1000		Thousands along cattle grazed creek	Biota (this survey)
*Cenchrus setiger	*	14/3/20	Contextual area	OPP-AL	-21.885991	120.122362	GDA94	20%			Biota (this survey)
*Cenchrus setiger	*	14/3/20	Contextual area	OPP-MM	-21.887674	120.115887	GDA94			dense on banks.	Biota (this survey)
*Cenchrus setiger	*	8/3/20	Contextual area	OPP-MM	-21.947865	120.102763	GDA94	15%		along creek.	Biota (this survey)

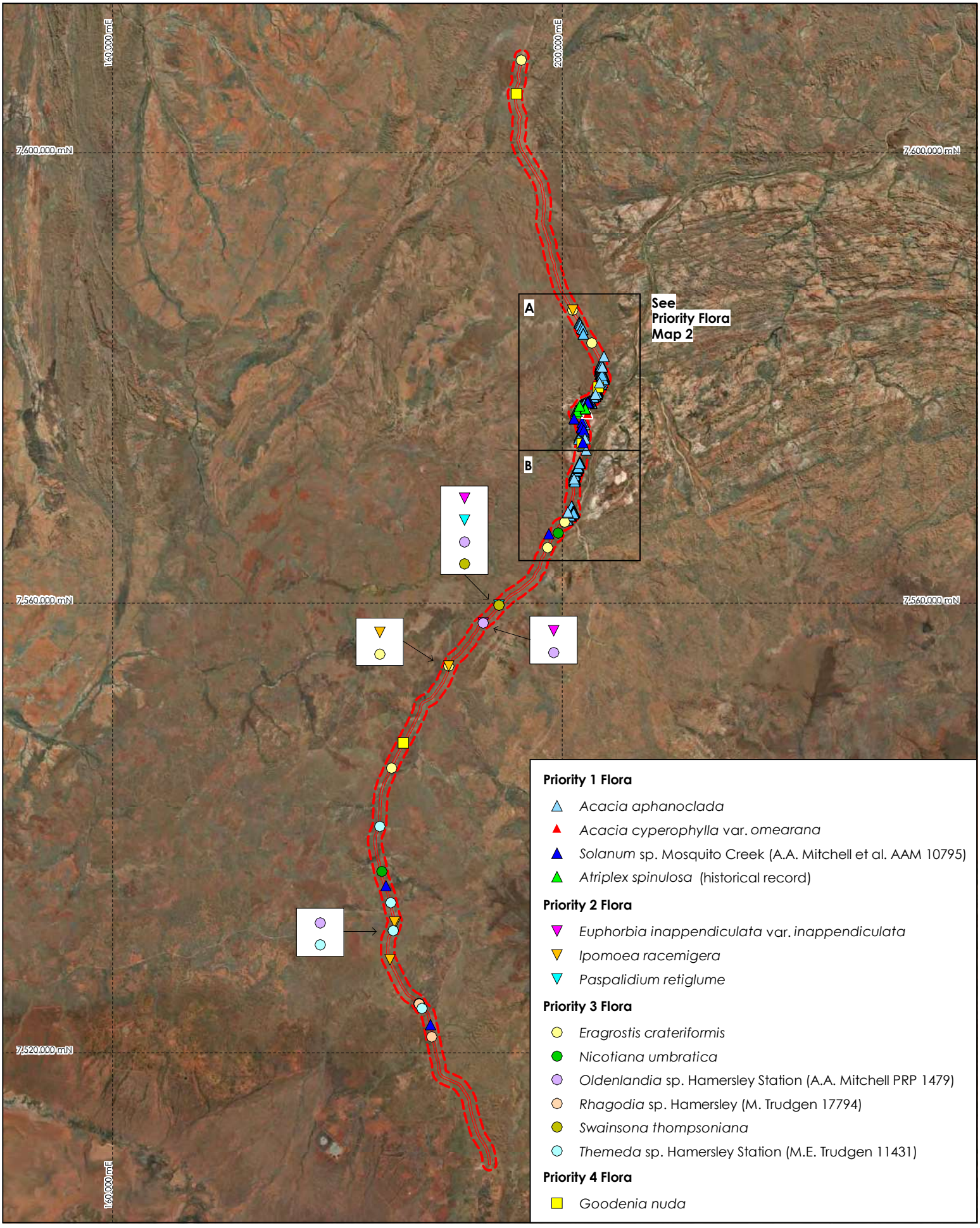
Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Cenchrus setiger	*	8/3/20	Contextual area	OPP-MM	-21.948171	120.10117	GDA94	10%			Biota (this survey)
*Cenchrus setiger	*	11/3/20	Contextual area	OPP-MM	-22.187644	119.936093	GDA94			boundary of EvVfCENspp to W, Ec massive trees along edge of sandy creek bed to E.	Biota (this survey)
*Citrullus colocynthis	*	6/3/20	Main survey area	MBU-REL09	-21.754338	120.089215	GDA94	0.1%	REL09-14		Biota (this survey)
*Citrullus colocynthis	*	10/3/20	Main survey area	MBU-REL17	-21.991593	120.08366	GDA94	0.1%	REL17-02		Biota (this survey)
*Citrullus colocynthis	*	9/3/20	Main survey area	MBU-REL14	-22.065445	120.015691	GDA94	0.1%	REL14-04		Biota (this survey)
*Citrullus colocynthis	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	5	MBU51-43		Biota (this survey)
*Citrullus colocynthis	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	0.1%	REL01-04A		Biota (this survey)
*Citrullus colocynthis	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	0.1%	REL14-04=		Biota (this survey)
*Citrullus colocynthis	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	0.1%	REL14-04=		Biota (this survey)
*Citrullus colocynthis	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	0.1%	MBU47-51	Tennis-ball sized fruit.	Biota (this survey)
*Citrullus colocynthis	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-45		Biota (this survey)
*Citrullus colocynthis	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.1%	MBU47-51=		Biota (this survey)
*Citrullus colocynthis	*	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	3		8cm round, mottled melon fruit.	Biota (this survey)
*Citrullus colocynthis	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	0.1%	MBU47-51=		Biota (this survey)
*Citrullus colocynthis	*	14/3/20	Main survey area	MBU-REL31	-22.429527	120.0017	GDA94	5	MBU47-51=		Biota (this survey)
*Cynodon dactylon	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	20%			Biota (this survey)
*Cynodon dactylon	*	8/3/20	Main survey area	OPP-MM	-21.96769	120.103986	GDA94			grazed "lawn".	Biota (this survey)
*Cynodon dactylon	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	2%	REL13-04		Biota (this survey)
*Cynodon dactylon	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	0.1%	REL13-04=		Biota (this survey)
*Cynodon dactylon	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	0.1%	REL13-04=		Biota (this survey)
*Cynodon dactylon	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-12	Prostrate.	Biota (this survey)
*Echinochloa colona	*	5/3/20	Main survey area	MBU-REL04	-21.611157	120.06434	GDA94	0.1%	REL04-12		Biota (this survey)
*Echinochloa colona	*	6/3/20	Main survey area	MBU-REL08	-21.691322	120.076257	GDA94	50	REL08-24	Base grazed.	Biota (this survey)
*Echinochloa colona	*	6/3/20	Main survey area	OPP-MM	-21.692361	120.07528	GDA94		MM52		Biota (this survey)
*Echinochloa colona	*	6/3/20	Main survey area	OPP-MM	-21.706824	120.083111	GDA94	50		scattered on road verge	Biota (this survey)
*Echinochloa colona	*	6/3/20	Main survey area	MBU-REL09	-21.754338	120.089215	GDA94	0.1%			Biota (this survey)
*Echinochloa colona	*	7/3/20	Main survey area	MBU18	-21.781465	120.095036	GDA94	0.1%	MBU18-19		Biota (this survey)
*Echinochloa colona	*	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0.1%	MBU30-26		Biota (this survey)
*Echinochloa colona	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	10	REL06-18		Biota (this survey)
*Echinochloa colona	*	8/3/20	Main survey area	OPP-MM	-21.964522	120.104505	GDA94	20%		grazed "lawn".	Biota (this survey)
*Echinochloa colona	*	8/3/20	Main survey area	OPP-MM	-21.96769	120.103986	GDA94			grazed "lawn".	Biota (this survey)
*Echinochloa colona	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	0.1%			Biota (this survey)
*Echinochloa colona	*	10/3/20	Main survey area	MBU-REL17	-21.991593	120.08366	GDA94	0.1%			Biota (this survey)
*Echinochloa colona	*	10/3/20	Main survey area	MBU-REL18	-22.001829	120.078108	GDA94	0.1%			Biota (this survey)
*Echinochloa colona	*	10/3/20	Main survey area	OPP-MM	-22.009924	120.074535	GDA94			occasional.	Biota (this survey)
*Echinochloa colona	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	1%	MBU51-25		Biota (this survey)
*Echinochloa colona	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	0.1%	REL01-04B		Biota (this survey)
*Echinochloa colona	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	0.1%			Biota (this survey)
*Echinochloa colona	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	10%			Biota (this survey)
*Echinochloa colona	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-15		Biota (this survey)
*Echinochloa colona	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	0.1%	REL25-12B		Biota (this survey)
*Echinochloa colona	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94	50%			Biota (this survey)
*Echinochloa colona	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.1%	MBU62-02		Biota (this survey)
*Echinochloa colona	*	6/3/20	Contextual area	MBU-REL05	-21.686366	120.074194	GDA94	0.1%	REL05-06		Biota (this survey)
*Echinochloa colona	*	8/3/20	Contextual area	OPP-MM	-21.948171	120.10117	GDA94			scattered.	Biota (this survey)
*Eragrostis cilianensis	*	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0.1%	MBU30-21		Biota (this survey)
*Eragrostis cilianensis	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	0.1%	REL01-33, 01-43		Biota (this survey)
*Eragrostis cilianensis	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	0.1%	MBU47-04, 47-47	Det confirmed by M Hislop (WAH).	Biota (this survey)
*Eragrostis cilianensis	*	11/3/20	Main survey area	OPP-MM	-22.187569	119.935703	GDA94		MM91		Biota (this survey)
*Eragrostis cilianensis	*	11/3/20	Main survey area	OPP-MM	-22.187977	119.935644	GDA94		MM90	Det confirmed by M Hislop (WAH). VOUCHER.	Biota (this survey)
*Eragrostis cilianensis	*	12/3/20	Main survey area	OPP-MM	-22.276549	119.940991	GDA94		MM90=		Biota (this survey)
*Euphorbia hirta	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	0.1%	MBU51-30		Biota (this survey)
*Euphorbia hirta	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	0.1%	REL15-04		Biota (this survey)
*Euphorbia hirta	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-21A		Biota (this survey)
*Euphorbia hirta	*	14/3/20	Nullagine Bypass	OPP-MM	-21.886677	120.119292	GDA94			scattered.	Biota (this survey)
*Flaveria trinervia	*	6/3/20	Main survey area	MBU-REL09	-21.754338	120.089215	GDA94	1			Biota (this survey)
*Flaveria trinervia	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	1			Biota (this survey)
*Flaveria trinervia	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	21			Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Indigofera hochstetteri	DP	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-35	Pea. Curved pod.	Biota (this survey)
*Leucaena leucocephala	*	14/3/20	Nullagine Bypass	OPP-MM	-21.886051	120.11236	GDA94	1	MM111	shrub with fine pinnate leaves.	Biota (this survey)
*Leucaena leucocephala	*	14/3/20	Contextual area	OPP-MM	-21.888464	120.113056	GDA94	10	MM111=	10 cm long flat pod.	Biota (this survey)
*Malvastrum americanum	*	6/3/20	Main survey area	MBU-REL07	-21.602571	120.067795	GDA94	15			Biota (this survey)
*Malvastrum americanum	*	6/3/20	Main survey area	MBU-REL08	-21.691322	120.076257	GDA94	15			Biota (this survey)
*Malvastrum americanum	*	6/3/20	Main survey area	OPP-MM	-21.692489	120.075365	GDA94	2			Biota (this survey)
*Malvastrum americanum	*	7/3/20	Main survey area	MBU18	-21.781465	120.095036	GDA94	10			Biota (this survey)
*Malvastrum americanum	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	5			Biota (this survey)
*Malvastrum americanum	*	10/3/20	Main survey area	MBU-REL02	-21.974136	120.096868	GDA94	0.1%			Biota (this survey)
*Malvastrum americanum	*	10/3/20	Main survey area	OPP-MM	-22.009924	120.074535	GDA94			occasional.	Biota (this survey)
*Malvastrum americanum	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	2			Biota (this survey)
*Malvastrum americanum	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	1			Biota (this survey)
*Malvastrum americanum	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	50			Biota (this survey)
*Malvastrum americanum	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	0.1%			Biota (this survey)
*Malvastrum americanum	*	11/3/20	Main survey area	OPP-MM	-22.15085	119.953321	GDA94	50			Biota (this survey)
*Malvastrum americanum	*	11/3/20	Main survey area	MBU53	-22.159878	119.948732	GDA94	1			Biota (this survey)
*Malvastrum americanum	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%			Biota (this survey)
*Malvastrum americanum	*	11/3/20	Main survey area	OPP-MM	-22.20508	119.933683	GDA94			scattered.	Biota (this survey)
*Malvastrum americanum	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	300			Biota (this survey)
*Malvastrum americanum	*	12/3/20	Main survey area	OPP-MM	-22.27716	119.941179	GDA94			abundant.	Biota (this survey)
*Malvastrum americanum	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94			scattered.	Biota (this survey)
*Malvastrum americanum	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.1%			Biota (this survey)
*Malvastrum americanum	*	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	50		Scattered.	Biota (this survey)
*Malvastrum americanum	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	2			Biota (this survey)
*Malvastrum americanum	*	14/3/20	Main survey area	MBU-REL22	-22.420675	119.988927	GDA94	0.1%			Biota (this survey)
*Malvastrum americanum	*	14/3/20	Main survey area	MBU-REL23	-22.420739	119.988899	GDA94	30			Biota (this survey)
*Malvastrum americanum	*	14/3/20	Main survey area	MBU-REL31	-22.429527	120.0017	GDA94	15			Biota (this survey)
*Malvastrum americanum	*	6/3/20	Contextual area	OPP-SC	-21.686871	120.070572	GDA94	1000		Thousands along cattle grazed creek	Biota (this survey)
*Passiflora foetida var. hispida	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	2	REL06-16		Biota (this survey)
*Passiflora foetida var. hispida	*	14/3/20	Main survey area	OPP-MM	-21.889779	120.109809	GDA94	1			Biota (this survey)
*Passiflora foetida var. hispida	*	14/3/20	Contextual area	OPP-MM	-21.888464	120.113066	GDA94	1			Biota (this survey)
*Physalis angulata	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	0.1%	MBU51-17		Biota (this survey)
*Physalis angulata	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	1	REL25-03		Biota (this survey)
*Physalis angulata	*	12/3/20	Main survey area	MBU65	-22.282148	119.940808	GDA94	0.1%	MBU65-33	Weed.	Biota (this survey)
*Physalis angulata	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94			scattered.	Biota (this survey)
*Physalis angulata	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.1%		Flowers yellow. Dentate-ovate lvs.	Biota (this survey)
*Setaria verticillata	*	9/3/20	Main survey area	MBU-REL14	-22.065445	120.015691	GDA94	1	REL14-07		Biota (this survey)
*Sigesbeckia orientalis	*	9/3/20	Main survey area	MBU52	-22.119431	119.97076	GDA94	1			Biota (this survey)
*Solanum nigrum	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	1	REL13-15		Biota (this survey)
*Solanum nigrum	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0.1%	MBU62-46		Biota (this survey)
*Sonchus oleraceus	*	9/3/20	Main survey area	MBU-REL01	-22.101732	119.989489	GDA94	0.1%	REL01-39		Biota (this survey)
*Sonchus oleraceus	*	12/3/20	Main survey area	OPP-MM	-22.292658	119.944073	GDA94			any widening to be on E side through this crossing , smaller scale creek veg	Biota (this survey)
*Stylosanthes hamata	*	6/3/20	Main survey area	MBU-REL08	-21.691322	120.076257	GDA94	0.1%	REL08-27		Biota (this survey)
*Tamarix aphylla	WoNS, DP	14/3/20	Contextual area	OPP-MM	-21.889083	120.112338	GDA94	1			Biota (this survey)
*Trianthema portulacastrum	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	0.1%	REL16-13		Biota (this survey)
*Trianthema portulacastrum	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-31		Biota (this survey)
*Trianthema portulacastrum	*	12/3/20	Main survey area	OPP-MM	-22.293734	119.944503	GDA94		MM104		Biota (this survey)
*Tribulus terrestris	*	11/3/20	Main survey area	OPP-MM	-22.152796	119.953022	GDA94		MM89	Small flowers. Sens. lat.	Biota (this survey)
*Tribulus terrestris	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0.1%	MBU54-42	Small flowers. Sens. lat.	Biota (this survey)
*Tribulus terrestris	*	11/3/20	Main survey area	MBU57	-22.195135	119.934106	GDA94	0.1%	MBU57-16	Stems ascending. Small flowers. Sens. lat.	Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	MBU-REL06	-21.889531	120.109069	GDA94	10			Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	OPP-MM	-21.94681	120.104864	GDA94	15		Verge	Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	OPP-MM	-21.964164	120.105171	GDA94	2			Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	OPP-MM	-21.964522	120.104505	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	OPP-MM	-21.9677	120.104005	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	8/3/20	Main survey area	MBU-REL13	-21.968229	120.104836	GDA94	2			Biota (this survey)
*Vachellia farnesiana	*	10/3/20	Main survey area	MBU-REL02	-21.974136	120.096868	GDA94	6			Biota (this survey)
*Vachellia farnesiana	*	10/3/20	Main survey area	MBU-REL17	-21.991593	120.08366	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	10/3/20	Main survey area	OPP-MM	-22.009924	120.074535	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	1			Biota (this survey)

Species	Ranking	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
*Vachellia farnesiana	*	9/3/20	Main survey area	OPP-SC	-22.112999	119.978975	GDA94	5			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	MBU-REL15	-22.113022	119.977697	GDA94	9			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	OPP-SC	-22.113081	119.978434	GDA94	5			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	OPP-SC	-22.11322	119.978253	GDA94	50			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	MBU52	-22.119431	119.97076	GDA94	3		NI=3 (1A, 2 J).	Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	OPP-AL	-22.120264	119.970099	GDA94	50		mature plants.	Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	MBU-REL16	-22.127786	119.96645	GDA94	30			Biota (this survey)
*Vachellia farnesiana	*	9/3/20	Main survey area	OPP-RW	-22.140631	119.959366	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	1.5%			Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.152493	119.952318	GDA94	4			Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.152796	119.953022	GDA94	2			Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	40			Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.185328	119.935899	GDA94			scattered.	Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.20508	119.933683	GDA94	3%		scattered to 3% cover.	Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.205096	119.933267	GDA94			scattered.	Biota (this survey)
*Vachellia farnesiana	*	11/3/20	Main survey area	OPP-MM	-22.207894	119.933267	GDA94			very occasional.	Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	MBU-REL25	-22.240156	119.931107	GDA94	50			Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	MBU-REL26	-22.250871	119.932029	GDA94	1			Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	OPP-MM	-22.251867	119.933804	GDA94	1%			Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	OPP-MM	-22.276323	119.940996	GDA94	1%			Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	OPP-MM	-22.27716	119.941179	GDA94			scattered.	Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	OPP-MM	-22.292122	119.943762	GDA94			scattered.	Biota (this survey)
*Vachellia farnesiana	*	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	3		Juveniles.	Biota (this survey)
*Vachellia farnesiana	*	13/3/20	Main survey area	OPP-MM	-22.322224	119.939222	GDA94			scattered in creek.	Biota (this survey)
*Vachellia farnesiana	*	13/3/20	Main survey area	OPP-MM	-22.34246	119.94964	GDA94			scattered in creek.	Biota (this survey)
*Vachellia farnesiana	*	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	5			Biota (this survey)
*Vachellia farnesiana	*	13/3/20	Main survey area	MBU-REL21	-22.390874	119.975197	GDA94	25			Biota (this survey)
*Vachellia farnesiana	*	14/3/20	Main survey area	MBU-REL22	-22.420675	119.988927	GDA94	0.1%			Biota (this survey)
*Vachellia farnesiana	*	14/3/20	Main survey area	MBU-REL23	-22.420739	119.988899	GDA94	45			Biota (this survey)

Appendix 13

Locations of Flora of Conservation Significance, and Threatened and Priority Flora Report Forms



Priority 1 Flora

- *Acacia aphanoclada*
- *Acacia cyperophylla* var. *omearana*
- *Solanum* sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)
- *Atriplex spinulosa* (historical record)

Priority 2 Flora

- *Euphorbia inappendiculata* var. *inappendiculata*
- *Ipomoea racemigera*
- *Paspalidium retiglume*

Priority 3 Flora

- *Eragrostis crateriformis*
- *Nicotiana umbratica*
- *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479)
- *Rhagodia* sp. Hamersley (M. Trudgen 17794)
- *Swainsona thompsoniana*
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431)

Priority 4 Flora

- *Goodenia nuda*



Survey area

Contextual area

N

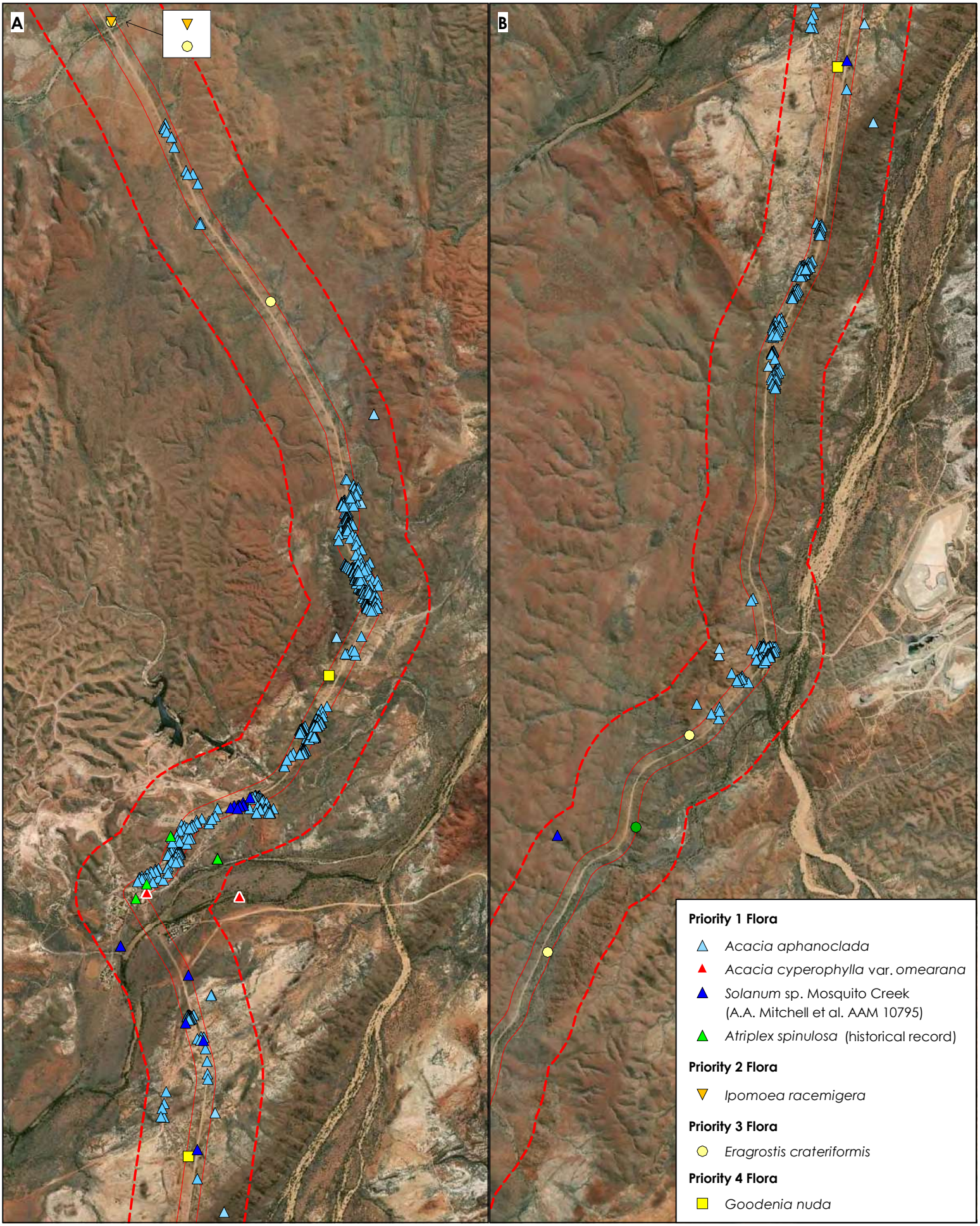
0 10 20

kilometres

Marble Bar Road Upgrade
Priority Flora Map 1

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: 08 Feb 2021 | Projection: MGA Z51 (GDA94) | Scale: 1:425,000



Location Map



Survey area

Contextual area

N

0 1 2

kilometres

Marble Bar Road Upgrade
Priority Flora Map 2

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 02 Oct 2020 | Revised: 08 Feb 2021 | Projection: MGA Z51 (GDA94) | Scale: 1:50,000

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.972618	120.09987	GDA94	1		Extends all the way to here and further S but only on W side, this location is the only one on E side.	Biota (current survey)
Acacia aphanoclada	P1	10/3/20	Main survey area	MBU-REL10	-21.972136	120.099135	GDA94	47			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.971907	120.099991	GDA94	20		AA_AL1S. Near a releve, however have marked the popn closest to road.	Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.971555	120.099969	GDA94	25		AA_AL1N. End of popn assoc with nearest opportunistic record of Acacia aphanoclada.	Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-RM	-21.969288	120.102976	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.969206	120.101923	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.969194	120.102746	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.969119	120.102573	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.969051	120.101791	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968979	120.101812	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968964	120.101967	GDA94	13			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968915	120.102297	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968831	120.102144	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968769	120.102213	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-ALBrM	-21.968636	120.102303	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96742	120.104514	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967403	120.104553	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967394	120.104582	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967356	120.104477	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96733	120.104516	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-RM	-21.967199	120.104761	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967154	120.103774	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967128	120.103843	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967043	120.104154	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-RM	-21.967025	120.104125	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967015	120.104048	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967014	120.104019	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.967001	120.10431	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966982	120.104262	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966974	120.10432	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966881	120.105173	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966782	120.105185	GDA94	6			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966692	120.105187	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966663	120.10511	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966635	120.105062	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966601	120.10515	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96658	120.105015	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966562	120.104986	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966505	120.103807	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966502	120.105181	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966494	120.10523	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966462	120.105501	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966411	120.105667	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96641	120.105618	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966382	120.105532	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-RM	-21.966245	120.104422	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966147	120.104521	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966125	120.10427	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966119	120.104473	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966091	120.104425	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966082	120.104377	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966037	120.104426	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966029	120.104475	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966011	120.104988	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.966005	120.105656	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965999	120.10432	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965985	120.104524	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965984	120.105008	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965983	120.104437	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965972	120.104311	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965971	120.105763	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965951	120.105696	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965945	120.104293	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965943	120.105241	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96594	120.104554	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965936	120.104283	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965916	120.105222	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965903	120.105493	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965896	120.104594	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965895	120.104555	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965891	120.104342	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.96587	120.105155	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965834	120.104169	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.965823	120.104556	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-RM	-21.965615	120.104531	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.961568	120.103346	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.96132	120.103574	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941572	120.106238	GDA94	3		Southern extent of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941472	120.106211	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941452	120.106085	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941328	120.106243	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941189	120.105994	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941167	120.106285	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941115	120.105908	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.941043	120.105949	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940705	120.106217	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940699	120.105878	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940581	120.106316	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940491	120.105844	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940417	120.106242	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940288	120.106128	GDA94	17			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.940135	120.106122	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.940074	120.106229	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.939982	120.106164	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.939949	120.106309	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93992	120.106213	GDA94	15			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.939841	120.10635	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93975	120.106294	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	12/8/07	Main survey area		-21.939444	120.105556		Common	Sheet 7808968	Spinifex grasses.	WA Herbarium Voucher
Acacia aphanoclada	P1	8/3/20	Main survey area	MBU38	-21.938819	120.106255	GDA94	20	MBU38-01	0.5% cover. Number estimated; not recorded.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.938344	120.105916	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938309	120.105975	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.938255	120.105976	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938244	120.10588	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938228	120.105977	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938182	120.105948	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938182	120.105958	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938164	120.105968	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938164	120.105968	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938155	120.105959	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938146	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.93813	120.106075	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105969	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938128	120.105979	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93812	120.106017	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938111	120.105989	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938102	120.106008	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.938085	120.106086	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.938075	120.106009	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.938005	120.106117	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936741	120.106113	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936646	120.105873	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936639	120.105951	GDA94	10			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.936593	120.106435	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936532	120.10605	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.936486	120.106515	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936419	120.106313	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936407	120.106139	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936337	120.106276	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936299	120.106151	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.936189	120.106579	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936028	120.106108	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.936002	120.106176	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935985	120.106225	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935983	120.10667	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935893	120.10613	GDA94	8			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935819	120.106035	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935797	120.106848	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935712	120.106124	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935706	120.106831	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935671	120.106386	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.935568	120.106176	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935339	120.106964	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935292	120.106365	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935278	120.107081	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935219	120.106308	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.935037	120.106747	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.934942	120.106972	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.933093	120.108112	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.933066	120.108074	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93304	120.108142	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932992	120.107979	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932976	120.108105	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932966	120.108057	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932956	120.108028	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932895	120.108107	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93287	120.108252	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93286	120.108185	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932859	120.108136	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932789	120.108263	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932765	120.108438	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932761	120.108206	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.932661	120.108169	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932532	120.10852	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932429	120.108309	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932372	120.108669	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932332	120.108466	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932274	120.108729	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932225	120.108526	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.932181	120.108585	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.931033	120.109025	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931025	120.109044	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931022	120.108918	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931017	120.108628	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931012	120.108851	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931011	120.108802	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.931009	120.108686	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930992	120.108745	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930977	120.108919	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930964	120.1092	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930957	120.108813	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930955	120.10921	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930944	120.109104	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930936	120.109114	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930908	120.108572	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930891	120.109134	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93089	120.108602	GDA94	2			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930865	120.108709	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930833	120.109416	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930831	120.109319	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930824	120.109445	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930815	120.109426	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930815	120.109455	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930813	120.10931	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930767	120.109301	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930758	120.109301	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930756	120.109146	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930719	120.109147	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93071	120.109118	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930708	120.109021	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930683	120.109138	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930613	120.109236	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930604	120.109236	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930579	120.10885	GDA94	1		Aca aphanoclada shrubs continue out to W	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93057	120.109382	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93056	120.109295	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.93054	120.109189	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.930536	120.109489	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930534	120.109383	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930531	120.109189	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930481	120.109432	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930471	120.109374	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.930467	120.109171	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930453	120.109414	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930449	120.109152	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93044	120.109182	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930437	120.109501	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930372	120.109406	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930368	120.109173	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930356	120.109532	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.930348	120.109561	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930347	120.109532	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930332	120.109706	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.930323	120.109697	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93031	120.108962	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930296	120.109697	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930258	120.109621	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93024	120.109582	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.93023	120.109031	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930186	120.109071	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930184	120.109467	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.930184	120.109999	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930137	120.109372	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930124	120.109188	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930123	120.10913	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.930082	120.109847	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930043	120.10918	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930027	120.109296	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.930007	120.109171	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.929966	120.109404	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.929849	120.109919	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.92976	120.110008	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.929711	120.109777	GDA94	50			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.929574	120.110196	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.927169	120.111018	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.927159	120.110941	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.927141	120.110941	GDA94	1		Didn't see any on walk from last point to this, can see another 15 extending N for ~100m and west for 50m	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.927106	120.111019	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926935	120.111052	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926926	120.111071	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926906	120.110946	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926789	120.110977	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926674	120.111125	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926647	120.111125	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.926646	120.111077	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926573	120.11103	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926545	120.110934	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926369	120.111228	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926338	120.110996	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926223	120.111115	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926198	120.111231	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.926036	120.110731	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.913483	120.114003	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.904118	120.115285	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.903621	120.115246	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.902421	120.115241	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.901227	120.115091	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.900397	120.114605	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-JK	-21.900265	120.114289	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.900132	120.11493	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.900099	120.11464	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898472	120.113454	GDA94	6		Recruitment.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898446	120.113532	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898436	120.113474	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.89841	120.113533	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898384	120.113611	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898339	120.113612	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898334	120.113805	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898318	120.113409	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898286	120.113661	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898264	120.113449	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898242	120.11372	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898238	120.113478	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898209	120.113392	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898197	120.113731	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898178	120.113683	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898163	120.113315	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898142	120.113693	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898139	120.113529	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898132	120.113606	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898128	120.113384	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898122	120.113568	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.89812	120.113461	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.898115	120.113674	GDA94	30			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.8981	120.113326	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.8981	120.113346	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898086	120.113578	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898085	120.11351	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898074	120.113414	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898068	120.113578	GDA94	8			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898067	120.113549	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898046	120.113356	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898041	120.11356	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.898031	120.113521	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-RM	-21.898003	120.113967	GDA94	30			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.897993	120.113435	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885432	120.110061	GDA94	37		South end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885324	120.108535	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885208	120.111159	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885098	120.108985	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885093	120.108724	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885091	120.10913	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885077	120.109333	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885034	120.109489	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.885028	120.11065	GDA94	1		North end of popn.	Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884958	120.109781	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884949	120.108717	GDA94	16			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884886	120.109289	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884845	120.10899	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884611	120.109527	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884576	120.111665	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884483	120.109964	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884418	120.10985	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884355	120.110392	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884346	120.110402	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884228	120.110347	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884134	120.110658	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.884123	120.111567	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883944	120.111648	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883606	120.112458	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883534	120.111976	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883504	120.112789	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883476	120.112257	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883418	120.112026	GDA94	1		N end of population.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.883169	120.112747	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.88311	120.112458	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882915	120.11165	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882891	120.111834	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882835	120.112734	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882828	120.112889	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882813	120.112532	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882786	120.112552	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882785	120.112484	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882754	120.11175	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882719	120.112833	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882708	120.112718	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.8827	120.112757	GDA94	2			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.88269	120.112708	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882684	120.112892	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	MBU41	-21.882672	120.112738	GDA94	5		0.1% cover. Recruitment noted. Number estimated; not recorded.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882663	120.112738	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882652	120.112632	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882648	120.112903	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882645	120.1127	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882611	120.112874	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882594	120.112933	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882592	120.112768	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882578	120.112005	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882556	120.112827	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882548	120.112885	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882454	120.112123	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882389	120.112531	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.882381	120.112628	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.882009	120.1125	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881866	120.113576	GDA94	8			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881732	120.112109	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881645	120.112855	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881489	120.112665	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881391	120.113818	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881368	120.114012	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881305	120.11352	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881262	120.112079	GDA94	19			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881218	120.113715	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.881135	120.112575	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880694	120.113687	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880618	120.112934	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880409	120.113876	GDA94	19			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880389	120.113277	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.88035	120.113607	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880295	120.11412	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880199	120.114287	GDA94	25			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880156	120.113359	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880096	120.114095	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.88007	120.114144	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.880061	120.11308	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879992	120.115877	GDA94	15		S end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879908	120.11465	GDA94	23		E end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879775	120.115862	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879645	120.114617	GDA94	1		W end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879564	120.116156	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.87951	120.115132	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.879326	120.116509	GDA94	2		N point of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.878573	120.116785	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.87836	120.119575	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877984	120.121284	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877914	120.121412	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877905	120.121402	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877905	120.121421	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877896	120.121422	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877849	120.121345	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877832	120.121365	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877749	120.121299	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877743	120.12039	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877702	120.121155	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877702	120.121184	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.87769	120.120991	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877634	120.120885	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877588	120.120325	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877586	120.120219	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877562	120.120916	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877525	120.120878	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877499	120.120907	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877498	120.120878	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877492	120.121033	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877475	120.12055	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877466	120.120579	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877464	120.120976	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877455	120.121005	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Main survey area	OPP-MM	-21.877422	120.120638	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.877404	120.120638	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.874721	120.123603	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.874612	120.123557	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.87412	120.123857	GDA94	1		S end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.873748	120.124242	GDA94	13		N end of popn.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873611	120.125163	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873548	120.125203	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873544	120.125464	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873544	120.125503	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87349	120.125504	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.873482	120.124537	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873393	120.125603	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873346	120.125507	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873338	120.125584	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87332	120.125594	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873318	120.125478	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873285	120.125653	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873279	120.125818	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873277	120.125702	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873238	120.125519	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873194	120.125587	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873192	120.12551	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873176	120.125578	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873157	120.12553	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873157	120.12553	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873156	120.125501	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873138	120.125521	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873137	120.125414	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873129	120.125492	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873129	120.125521	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87312	120.125511	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.873094	120.125551	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872202	120.126149	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872148	120.126169	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872137	120.126092	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872124	120.12585	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872093	120.126625	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872068	120.126277	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872062	120.126413	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87205	120.126268	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872023	120.1268	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872003	120.126685	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.872002	120.126627	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871949	120.126695	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871905	120.126735	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871887	120.126764	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87187	120.126794	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871764	120.126419	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871754	120.126351	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	12/10/04	Main survey area		-21.871667	120.125556			Sheet 6927661, Population 90688		WA Herbarium Voucher, Main Roads
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871617	120.125213	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87161	120.126373	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871402	120.125323	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871375	120.125334	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871349	120.125373	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871339	120.125325	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871331	120.125383	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87133	120.125354	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871328	120.125247	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87132	120.125306	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871319	120.125228	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871304	120.125383	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871302	120.125287	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871295	120.125422	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871294	120.125335	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871232	120.125414	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871178	120.125444	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871128	120.125648	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871042	120.126936	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871033	120.126926	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871029	120.126685	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871025	120.127004	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871025	120.127014	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871024	120.126917	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87102	120.126704	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871015	120.126965	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871009	120.126617	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.871009	120.126617	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870967	120.125758	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87096	120.12687	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87094	120.126774	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87094	120.126812	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870938	120.126677	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870931	120.126783	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870921	120.126706	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870885	120.126755	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870884	120.127219	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870848	120.126679	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87082	120.126612	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.87082	120.126621	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870697	120.127359	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	MBU28	-21.870665	120.127059	GDA94	78	MBU27-03=		Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870662	120.127408	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870645	120.127456	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870645	120.127456	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870516	120.127304	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870468	120.12716	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870387	120.127142	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-BrM	-21.870374	120.12693	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870346	120.126863	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870333	120.127163	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870302	120.12696	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870293	120.126941	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-MM	-21.870114	120.127583	GDA94	3		Dropped pin.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.869863	120.127153	GDA94	5		Separate popn to the one 50 m N.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.869663	120.127553	GDA94	25		S end of popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.869417	120.127433	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.869138	120.128009	GDA94	1		N point of popn.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	MBU33	-21.864352	120.131015	GDA94	5		0.1% cover. Number estimated; not recorded.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.864247	120.130147	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.864238	120.130157	GDA94	5		Recruitment.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.864198	120.129955	GDA94	5		S point of popn.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Main survey area	OPP-AL	-21.863944	120.130907	GDA94	5		Near site MBU33.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-AL	-21.863885	120.130647	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.862585	120.131621	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.860194	120.132713	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.860187	120.132849	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.860046	120.132523	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859995	120.13323	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859978	120.133269	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859951	120.132235	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859912	120.133125	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859897	120.132255	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859875	120.133077	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859852	120.132256	GDA94	13			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859833	120.132218	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859816	120.132266	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859815	120.132228	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859733	120.132162	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859725	120.132258	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859725	120.132268	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85969	120.132288	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859653	120.132269	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859635	120.13225	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859599	120.132261	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859528	120.133384	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859455	120.132273	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859435	120.132167	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859426	120.132168	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859418	120.132245	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859407	120.133145	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859372	120.132178	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859336	120.132198	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859316	120.133117	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859298	120.132112	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.859003	120.132224	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858998	120.131963	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858995	120.132292	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858992	120.132109	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858983	120.132157	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858981	120.132031	GDA94	8			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858974	120.132138	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858968	120.132341	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858924	120.13239	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858921	120.132187	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858921	120.133241	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858916	120.13242	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858911	120.132168	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858906	120.132362	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858895	120.132246	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858888	120.132362	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858883	120.132111	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858874	120.132121	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858869	120.132304	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858855	120.132053	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858854	120.131995	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858844	120.131938	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858834	120.131851	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858828	120.132025	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858827	120.133021	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85882	120.133137	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85879	120.132954	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858654	120.132396	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858607	120.13229	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858605	120.132174	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858604	120.132145	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858584	120.132533	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858531	120.132601	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858513	120.13264	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858511	120.132002	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858506	120.132196	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858504	120.13208	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858477	120.132129	GDA94	2			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858475	120.131993	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.858475	120.133018	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85847	120.132206	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858467	120.132032	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858443	120.132207	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858431	120.132081	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858406	120.132198	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858293	120.132432	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858233	120.132066	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858228	120.131805	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858221	120.131921	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858218	120.131766	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858203	120.131941	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858202	120.131844	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858201	120.131815	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858194	120.131902	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858186	120.13197	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858181	120.131699	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858177	120.132502	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858176	120.131903	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858174	120.131787	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858158	120.131913	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858154	120.131719	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858148	120.131884	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858147	120.131797	GDA94	1		Too many individuals to keep recording single plants.	Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858146	120.131777	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858145	120.13169	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858138	120.131826	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858137	120.131778	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858128	120.131739	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858127	120.131681	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85812	120.131836	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858119	120.131778	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858118	120.13171	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858118	120.13172	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85811	120.131788	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858092	120.131759	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858089	120.131605	GDA94	1		Continues out to W into context area, all through this population	Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858082	120.13174	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858065	120.13175	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858047	120.13175	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.858047	120.13177	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85796	120.131423	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.85785	120.133427	GDA94	25			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.857772	120.132568	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857613	120.131749	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857604	120.13175	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857595	120.131237	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857543	120.131354	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857497	120.131829	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857478	120.131249	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857451	120.131782	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857405	120.131715	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857404	120.131667	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857387	120.131696	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85737	120.131764	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857365	120.131484	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85736	120.131706	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857338	120.131484	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857332	120.131668	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857303	120.131543	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857301	120.131446	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857299	120.131872	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857293	120.131485	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.85729	120.132897	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857235	120.131254	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857229	120.131457	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857195	120.131071	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857167	120.131536	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857152	120.131198	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857132	120.131092	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85713	120.131469	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85713	120.131488	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857113	120.131537	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85708	120.131712	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857034	120.131655	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857034	120.131664	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85703	120.131413	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85703	120.131432	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857003	120.131442	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.857002	120.131404	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85699	120.131211	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85699	120.131211	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856986	120.131511	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856985	120.131414	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856982	120.131269	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856976	120.131414	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856973	120.13124	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856973	120.131288	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856962	120.131134	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856961	120.131588	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856956	120.131347	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856938	120.131347	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856918	120.131193	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856912	120.131406	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856907	120.131135	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856892	120.131261	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856891	120.131735	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.856889	120.132692	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856871	120.13161	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856825	120.131591	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856824	120.13103	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85678	120.131602	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856762	120.131592	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.856746	120.132212	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856654	120.131595	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856635	120.131556	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856596	120.131373	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856553	120.131509	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856544	120.130988	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856543	120.130959	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856541	120.131355	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856525	120.130969	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856523	120.131346	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856516	120.13094	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856508	120.130998	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.856417	120.132025	GDA94	30			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856407	120.131435	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856407	120.131445	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856406	120.131367	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856388	120.131358	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856363	120.130972	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856362	120.131446	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856343	120.131398	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856336	120.130953	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856307	120.131369	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856289	120.13136	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856277	120.130712	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.85626	120.132308	GDA94	9			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856217	120.130888	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856212	120.13113	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856209	120.130946	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85619	120.130888	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85616	120.130715	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856149	120.131111	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856125	120.130774	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856104	120.131151	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856102	120.130513	GDA94	1		Seedling.	Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856099	120.130851	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856091	120.130871	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856082	120.130919	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856076	120.131103	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.856045	120.131887	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.856001	120.130418	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.855971	120.130235	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.855963	120.132334	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.855925	120.130197	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85589	120.130217	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.855835	120.130199	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.855798	120.130161	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.855739	120.131419	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.855734	120.130104	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.855709	120.131758	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.855475	120.13128	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	MBU27	-21.855256	120.13169	GDA94	45	MBU27-03		Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.854914	120.131223	GDA94	12			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.854702	120.131479	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.854003	120.13127	GDA94	65			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.853494	120.129501	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.853325	120.130684	GDA94	22			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.853227	120.131257	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.85304	120.130903	GDA94	15			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.852908	120.129532	GDA94	25			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852857	120.130259	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852822	120.130308	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85282	120.130201	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852747	120.130135	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852737	120.130097	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85271	120.130088	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852641	120.129751	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852631	120.130244	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852607	120.130418	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85258	120.130409	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852571	120.130419	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852538	120.130033	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85253	120.13012	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852522	120.130178	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85251	120.129985	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852504	120.130188	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852503	120.13013	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852486	120.130198	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852484	120.130063	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852466	120.130073	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852461	120.130305	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852443	120.130306	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852441	120.130209	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852431	120.130132	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852335	120.130298	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852239	120.130503	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852227	120.130329	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852221	120.130503	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852209	120.13033	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852185	120.130495	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852111	120.130428	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85211	120.130351	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.852085	120.130477	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.852066	120.130961	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.852045	120.130768	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85204	120.130488	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851967	120.13046	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851957	120.130393	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851923	120.130519	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851903	120.130413	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.851865	120.13082	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851859	120.130482	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851848	120.130337	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851842	120.13053	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851815	120.130502	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851797	120.130541	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851789	120.130077	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851787	120.129961	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851751	120.130474	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851663	120.130099	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851632	120.13038	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851616	120.130487	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851488	120.130383	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851415	120.130346	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851407	120.130413	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851361	120.130366	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851361	120.130395	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851333	120.130337	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851306	120.130328	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851298	120.130387	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851226	120.130388	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851217	120.130388	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851215	120.130301	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.85119	120.130389	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851146	120.130486	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.851119	120.130448	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850989	120.130257	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850942	120.130162	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850916	120.13021	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850866	120.130444	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850858	120.130511	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850354	120.130106	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.850291	120.131112	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850166	120.130158	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850152	120.129887	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850105	120.130275	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850098	120.129879	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.850089	120.130933	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850077	120.130227	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.850011	120.130074	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849993	120.131138	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849984	120.130113	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849977	120.13022	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849971	120.129862	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849953	120.130897	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849949	120.130162	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849941	120.130211	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849908	120.129882	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849866	120.130038	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849861	120.130802	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849822	120.130087	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849815	120.131296	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849777	120.130108	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.849725	120.130225	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849664	120.130883	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.8495	120.13078	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849491	120.130829	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849364	120.130744	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849349	120.130928	GDA94	14			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849257	120.131346	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849156	120.13129	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.849022	120.13137	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.848659	120.131222	GDA94	8			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.848587	120.131224	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.848296	120.131143	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.847788	120.130457	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-SC	-21.847731	120.130313	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.823428	120.116114	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.82339	120.116008	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.823302	120.116155	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Main survey area	OPP-MM	-21.823283	120.116107	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.819625	120.115939	GDA94	5		Separate from nearest popn.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.818713	120.114923	GDA94	4		Southernmost plants of popn between here and approx 100m N.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.818705	120.115454	GDA94	8		Separate popn from the nearest recorded one.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.818359	120.114775	GDA94	8		Northernmost plant of the popn, approx 100m south of this point. Recruitment observed.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.816136	120.113631	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.815184	120.11335	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.81467	120.112896	GDA94	1		Southernmost plant of populations approx 250m north of this point.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.814351	120.112709	GDA94	2		Juvenile	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.814333	120.11269	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.81426	120.112682	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.814169	120.112616	GDA94	7		All counted 1 m from road.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Main survey area	OPP-ALBrM	-21.81391	120.112767	GDA94	42		Northernmost point of population south of this point.	Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.87909	120.122055	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.87909	120.122104	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.879086	120.121862	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.879074	120.120673	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.879065	120.120673	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.87906	120.121911	GDA94	4			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.878963	120.122058	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-JK	-21.878809	120.122013	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878783	120.121046	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878757	120.121627	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878757	120.121636	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878747	120.12154	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.87871	120.121541	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878694	120.121115	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878694	120.121609	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878671	120.122412	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878612	120.121088	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878501	120.121932	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.878436	120.12084	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.8781	120.121737	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Contextual area	OPP-MM	-21.971216	120.097654	GDA94	500		Aca aphanoclada goes to roughly here, dropped pin, say N=500 in total.	Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Contextual area	OPP-MM	-21.968364	120.101234	GDA94	50		On slope, dropped pin; outside survey area	Biota (current survey)
Acacia aphanoclada	P1	14/5/79	Contextual area		-21.966667	120.1			Sheet 167541, 379131	Eucalyptus leucophloia, Acacia pyrifolia and Spinifex.	WA Herbarium Voucher
Acacia aphanoclada	P1	24/10/88	Contextual area		-21.966667	120.1			Sheet 991937, 991945, 991953		WA Herbarium Voucher
Acacia aphanoclada	P1	8/3/20	Contextual area	OPP-MM	-21.96618	120.10332	GDA94	10		OUTSIDE SURVEY AREA, Can see 10 plants on this conical hill, but bound to be more. Dropped pin	Biota (current survey)
Acacia aphanoclada	P1	24/10/88	Contextual area		-21.965972	120.100083			Population 90683		Main Roads
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-RM	-21.940752	120.106342	GDA94	10			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-RM	-21.940455	120.106367	GDA94	5			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.940149	120.106421	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.940098	120.106587	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.93983	120.106757	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.939743	120.106449	GDA94	15		Northern extent	Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.939693	120.106634	GDA94	7			Biota (current survey)
Acacia aphanoclada	P1	8/3/20	Contextual area	OPP-MM	-21.930836	120.108603	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.930111	120.108946	GDA94	20			Biota (current survey)
Acacia aphanoclada	P1	21/5/82	Contextual area		-21.916667	120.116667			Sheet 379158		WA Herbarium Voucher
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-RM	-21.907632	120.110774	GDA94	15		Contextual area	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.907572	120.110456	GDA94	1		Contextual area.	Biota (current survey)
Acacia aphanoclada	P1	7/4/95	Contextual area		-21.907306	120.115944			Population 90684		Main Roads
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-JK	-21.906771	120.110579	GDA94	30		Contextual area.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-RM	-21.906341	120.1108	GDA94	20		Contextual area.	Biota (current survey)
Acacia aphanoclada	P1	15/3/20	Contextual area	OPP-RM	-21.905217	120.111007	GDA94	1		Contextual area.	Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Contextual area	OPP-MM	-21.896184	120.115764	GDA94	1			Biota (current survey)
Acacia aphanoclada	P1	14/3/20	Contextual area	OPP-MM	-21.896139	120.115803	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	15/8/63	Contextual area		-21.883333	120.116667		locally frequent.	Sheet 167495	Spinifex.	WA Herbarium Voucher
Acacia aphanoclada	P1	28/8/78	Contextual area		-21.883333	120.116667			Sheet 167533		WA Herbarium Voucher
Acacia aphanoclada	P1	6/10/82	Contextual area		-21.883333	120.116667			Sheet 167525	Dry scrubland.	WA Herbarium Voucher
Acacia aphanoclada	P1	11/11/87	Contextual area		-21.883333	120.116667			Sheet 856320		WA Herbarium Voucher
Acacia aphanoclada	P1	14/3/20	Contextual area	OPP-MM	-21.878638	120.120004	GDA94	6			Biota (current survey)
Acacia aphanoclada	P1	5/8/74	Contextual area		-21.862639	120.129111			Population 90682		Main Roads
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-MM	-21.858859	120.131734	GDA94	1		OUTSIDE SURVEY AREA.	Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-MM	-21.858078	120.13146	GDA94	1		OUTSIDE SURVEY AREA.	Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.857325	120.133322	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.85567	120.132629	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.85441	120.131833	GDA94	3			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.853518	120.131377	GDA94	14			Biota (current survey)
Acacia aphanoclada	P1	7/7/03	Contextual area		-21.850038	120.131894			Sheet 6492231		WA Herbarium Voucher
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.848754	120.13152	GDA94	2			Biota (current survey)
Acacia aphanoclada	P1	7/3/20	Contextual area	OPP-SC	-21.848566	120.131592	GDA94	38			Biota (current survey)
Acacia aphanoclada	P1	28/6/81	Contextual area		-21.841667	120.133333		scattered. Seems confined to the general region of Nullagine.	Sheets 167932, 167924	Spinifex.	WA Herbarium Voucher

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Acacia cyperophylla var. *omearana*	P1	14/3/20	Nullagine Bypass	OPP-MM	-21.886922	120.118793	GDA94	1	MM112	12m tree on bank of Nullagine River, pendulous branches, weeping foliage	Biota (current survey)
Acacia cyperophylla var. *omearana*	P1	12/8/07	Main survey area†		-21.886389	120.109444		6-20 plants.	Sheet 7808917	Medium trees. † Location incorrect: text description says 2km E of Nullagine, therefore outside contextual area.	WA Herbarium Voucher
Atriplex spinulosa	P1	1/8/96	Main survey area		-21.886944	120.108333			Sheet 4923170	Hard hummock grassland of Triodia longiceps.	WA Herbarium Voucher
Atriplex spinulosa	P1	6/8/74	Main survey area		-21.885556	120.109444			Population 86044		Main Roads
Atriplex spinulosa	P1	12/8/65	Contextual area		-21.891389	120.106667			Sheet 2529793, Sheet 2529777		WA Herbarium Voucher
Atriplex spinulosa	P1	6/8/74	Contextual area		-21.883333	120.116667			Sheet 2529769, 1580884, 2529785		WA Herbarium Voucher
Atriplex spinulosa	P1	6/8/74	Contextual area		-21.881111	120.111944			Population 86045		Main Roads
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	OPP-MM	-21.877619	120.120064	GDA94	1		Already found in this area by WoodGIS.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-MM	-21.878077	120.119377	GDA94	1			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	OPP-MM	-21.878339	120.119372	GDA94	1	MM113	Already found in this area by WoodGIS.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-MM	-21.878338	120.11884	GDA94	1			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-MM	-21.878341	120.118995	GDA94	1			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	OPP-MM	-21.87834	120.118434	GDA94	1		Already found in this area by WoodGIS.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-MM	-21.878378	120.119033	GDA94	1			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-MM	-21.878396	120.119042	GDA94	7		Might have been less mature spinifex when last surveyed.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-JK	-21.878523	120.118063	GDA94	1			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	14/3/20	Main survey area	OPP-JK	-21.878644	120.118757	GDA94	6			Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	OPP-MM	-21.894231	120.113511	GDA94	1		Already found in this area by WoodGIS.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	8/3/20	Main survey area	MBU42	-21.898746	120.11313	GDA94	1	MBU42-12	0.1% cover. PLDK: matches MBU69-33.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	OPP-MM	-21.900429	120.114895	GDA94	1		Already found in this area by WoodGIS.	Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/3/20	Main survey area	MBU-REL19	-22.262829	119.937088	GDA94	1	REL19-08	0.1% cover. PLDK: matches 69-33.	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	13/3/20	Main survey area	MBU69	-22.374954	119.973169	GDA94	19	MBU69-33	Det by M Hislop (WAH).	Biota (current survey)
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	10/5/17	Main survey area		-21.91075	120.114083		infrequent.	Sheet 8950652	Burnt Triodia longiceps hummock grassland.	WA Herbarium Voucher
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	6/8/74	Contextual area		-21.983333	120.083333			Sheet 3699773		WA Herbarium Voucher
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	P1	12/8/65	Contextual area		-21.891389	120.106667			Sheet 3699935		WA Herbarium Voucher
Euphorbia inappendiculata var. *inappendiculata*	P2	9/3/20	Main survey area	MBU46	-22.053875	120.025171	GDA94	0	MBU46-12	0.1% cover. PLDK: papillose capsules; difficult to key (kept keying to vicina). Det confirmed by M Hislop (WAH). VOUCHER.	Biota (current survey)
Euphorbia inappendiculata var. *inappendiculata*	P2	9/3/20	Main survey area	MBU55	-22.039858	120.039124	GDA94	0	MBU55-14	0.1% cover	Biota (current survey)
Ipomoea racemigera	P2	13/3/20	Main survey area	OPP-MM	-22.322313	119.939321	GDA94	2		White flowers.	Biota (current survey)
Ipomoea racemigera	P2	12/3/20	Main survey area	MBU62	-22.292368	119.944678	GDA94	0	MBU62-25	0.1% cover	Biota (current survey)
Ipomoea racemigera	P2	12/3/20	Main survey area	OPP-MM	-22.292324	119.943723	GDA94	0	MM100	0.1% cover. white flowers.	Biota (current survey)
Ipomoea racemigera	P2	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	0	MBU51-42	0.1% cover	Biota (current survey)
Ipomoea racemigera	P2	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0	MBU30-02	0.1% cover. Flowers white.	Biota (current survey)
Paspalidium retiglume	P2	9/3/20	Main survey area	MBU55	-22.039858	120.039124	GDA94	0	MBU55-16	0.1% cover	Biota (current survey)
Eragrostis crateriformis	P3	11/3/20	Main survey area	MBU54	-22.168503	119.943893	GDA94	0	MBU54-46	0.1% cover. Det confirmed by M Hislop (WAH). VOUCHER.	Biota (current survey)
Eragrostis crateriformis	P3	9/3/20	Main survey area	MBU51	-22.087718	119.994772	GDA94	0	MBU51-04	0.1% cover. PLDK: matches MBU54-46.	Biota (current survey)
Eragrostis crateriformis	P3	10/3/20	Main survey area	OPP-MM	-21.994327	120.082123	GDA94	0		0.1% cover. scattered in degraded floodplain.	Biota (current survey)
Eragrostis crateriformis	P3	10/3/20	Main survey area	MBU-REL02	-21.974136	120.096868	GDA94	0	REL02-05	0.1% cover	Biota (current survey)
Eragrostis crateriformis	P3	8/3/20	Main survey area	MBU32	-21.830871	120.123109	GDA94	0	MBU32-23	0.1% cover. PLDK: matches MBU54-46.	Biota (current survey)
Eragrostis crateriformis	P3	8/3/20	Main survey area	MBU30	-21.804222	120.10748	GDA94	0	MBU30-28	0.1% cover	Biota (current survey)
Eragrostis crateriformis	P3	22/4/13	Main survey area		-21.60277	120.067337			Sheet 8568871	Low isolated clumps of trees to mid open woodland (Corymbia hamersleyana and Eucalyptus victrix) over mid to tall shrubland (Acacia pyrifolia, A. tumida and A. trachycarpa) over low isolated hummock grasses (Triodia epactia) over low isolated tussock gra	WA Herbarium Voucher
Nicotiana umbratica	P3	12/3/20	Main survey area	OPP-MM	-22.251479	119.933835	GDA94	5	MM93A	Juveniles growing in shade of small overhang on top of ridge	Biota (current survey)
Nicotiana umbratica	P3	10/3/20	Main survey area	OPP-MM	-21.982729	120.091264	GDA94	2	MM87B	S-facing sheltered spot, at base of large granite boulder, 35 cm tall.	Biota (current survey)
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	13/3/20	Main survey area	MBU66	-22.298958	119.942625	GDA94	0	MBU66-43	0.1% cover. Flowers blue.	Biota (current survey)
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	9/3/20	Main survey area	MBU46	-22.053875	120.025171	GDA94	0	MBU46-13	0.1% cover	Biota (current survey)
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	9/3/20	Main survey area	MBU55	-22.039858	120.039124	GDA94	0	MBU55-12A	0.1% cover	Biota (current survey)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	13/3/20	Main survey area	MBU60	-22.384824	119.973894	GDA94	1			Biota (current survey)

Species	Status	Date	Location	Site	Latitude	Longitude	Datum	Abundance (Number / % Cover)	Specimen	Comments	Source
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	13/3/20	Main survey area	OPP-MM	-22.3581	119.963545	GDA94	1			Biota (current survey)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	1/6/16	Main survey area		-22.358295	119.963752	GDA94	2			GHD (2016)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	13/3/20	Main survey area	OPP-MM	-22.357998	119.963678	GDA94	1			Biota (current survey)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	13/3/20	Main survey area	OPP-MM	-22.357947	119.963532	GDA94	1			Biota (current survey)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	13/3/20	Main survey area	OPP-MM	-22.357842	119.963364	GDA94	1			Biota (current survey)
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	1/6/16	Main survey area		-22.353092	119.957568	GDA94	3			GHD (2016)
Swainsona thompsoniana	P3	9/3/20	Main survey area	MBU55	-22.039858	120.039124	GDA94	0	MBU55-12	0.1% cover. MET det.	Biota (current survey)
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	13/3/20	Main survey area	MBU-REL27	-22.361937	119.965945	GDA94	0	REL27-06	0.1% cover	Biota (current survey)
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	13/3/20	Main survey area	MBU66	-22.298958	119.942625	GDA94	25	MBU66-32		Biota (current survey)
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	12/3/20	Main survey area	OPP-MM	-22.276558	119.94103	GDA94	5	MM98	Digi 12: 175-176	Biota (current survey)
Themeda ? sp. Hamersley Station (M.E. Trudgen 11431)	P3?	12/3/20	Main survey area	MBU50	-22.215171	119.932682	GDA94	0	MBU50-07	0.1% cover. MET det. Send to Herbarium.	Biota (current survey)
Goodenia nuda	P4	11/3/20	Main survey area	MBU47	-22.148665	119.95437	GDA94	0	MBU47-07	0.1% cover	Biota (current survey)
Goodenia nuda	P4	4/3/20	Main survey area	MBU31	-21.911356	120.113166	GDA94	0	MBU31-07	0.1% cover. Det confirmed by M Hislop (WAH).	Biota (current survey)
Goodenia nuda	P4	7/3/20	Main survey area	MBU35	-21.866245	120.12826	GDA94	0	MBU35-15	0.1% cover	Biota (current survey)
Goodenia nuda	P4	30/6/13	Contextual area		-21.629892	120.06262			Sheet 8511551	Low sparse shrubland dominated by Acacia trachycarpa over mid hummock grassland of Triodia longiceps and mid open tussock grassland dominated by Chrysopogon fallax.	WA Herbarium Voucher

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 8.5 km north of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.81391

Long / Easting: 120.112767

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				42
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Hummock grassland (Triodia epactia)
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [signature] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_01

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.814169	120.112616	7	All counted 1 m from road.
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.81426	120.112682	5	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.814333	120.11269	2	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.814351	120.112709	2	Juvenile
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.81467	120.112896	1	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.815184	120.11335	3	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.816136	120.113631	1	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.818359	120.114775	8	Recruitment observed.
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.818705	120.115454	8	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.818713	120.114923	4	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.819625	120.115939	5	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.81391	120.112767	42	This record described on ACAaph_TPRF_01

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 7.6 km north of Walters Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.823283

Long / Easting: 120.116107

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Sparse shrubland (Acacia orthocarpa)
2. Hummock grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [signature] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_02

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	7/03/2020	OPP-MM	-21.823302	120.116155	1
Acacia aphanoclada	7/03/2020	OPP-MM	-21.82339	120.116008	1
Acacia aphanoclada	7/03/2020	OPP-MM	-21.823428	120.116114	1
Acacia aphanoclada	7/03/2020	OPP-MM	-21.823283	120.116107	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 5.1 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.849349

Long / Easting: 120.130928

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				14
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Sparse shrubland (Acacia trachycarpa)
2. Hummock grassland (Triodia epcatia, T. longiceps)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000037 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office ☐ [redacted] District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_03

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	7/3/20	OPP-SC	-21.849953	120.130897	3
Acacia aphanoclada	7/3/20	OPP-SC	-21.849993	120.131138	5
Acacia aphanoclada	7/3/20	OPP-SC	-21.850089	120.130933	3
Acacia aphanoclada	7/3/20	OPP-SC	-21.847731	120.130313	5
Acacia aphanoclada	7/3/20	OPP-SC	-21.847788	120.130457	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.848296	120.131143	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.848587	120.131224	4
Acacia aphanoclada	7/3/20	OPP-SC	-21.848659	120.131222	8
Acacia aphanoclada	7/3/20	OPP-SC	-21.849022	120.13137	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.849156	120.13129	2
Acacia aphanoclada	7/3/20	OPP-SC	-21.849257	120.131346	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.849364	120.130744	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.849491	120.130829	5
Acacia aphanoclada	7/3/20	OPP-SC	-21.8495	120.13078	3
Acacia aphanoclada	7/3/20	OPP-SC	-21.849664	120.130883	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.849815	120.131296	1
Acacia aphanoclada	7/3/20	OPP-SC	-21.849861	120.130802	5
Acacia aphanoclada	7/3/20	OPP-SC	-21.849349	120.130928	14

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P1 New population: ☐

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 4.6 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.855256 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.13169 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				45
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				45

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Hardey Formation; rhyodacite.				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Open shrubland (Acacia bivenosa)
2. Hummock grassland (Triodia brizoides, T. epactia, T. wiseana)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Tribulus suberosus, Senna glutinosa subsp. pruinosa, Senna artemisioides subsp. oligophylla x S. symonii

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Quadrat data and additional records for this population are attached. Within 500 m of WAH Voucher (Sheet 6492231).

DRF PERMIT/ LICENCE No: FB62000037 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Quadrat data, additional records.

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

One quadrat recorded by Biota (MBU27) was also sampled within this population. Quadrat data is attached.

Biota TPRF reference: 1509_ACAaph_TPRF_04

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-SC	-21.850291	120.131112	7	
Acacia aphanoclada	7/3/20	OPP-SC	-21.851865	120.13082	4	
Acacia aphanoclada	7/3/20	OPP-SC	-21.852045	120.130768	6	
Acacia aphanoclada	7/3/20	OPP-SC	-21.852066	120.130961	1	
Acacia aphanoclada	7/3/20	MBU27	-21.855256	120.13169	45	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85304	120.130903	15	
Acacia aphanoclada	7/3/20	OPP-SC	-21.853227	120.131257	6	
Acacia aphanoclada	7/3/20	OPP-SC	-21.853325	120.130684	22	
Acacia aphanoclada	7/3/20	OPP-SC	-21.853518	120.131377	14	
Acacia aphanoclada	7/3/20	OPP-SC	-21.854003	120.13127	65	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85441	120.131833	3	
Acacia aphanoclada	7/3/20	OPP-SC	-21.854702	120.131479	15	
Acacia aphanoclada	7/3/20	OPP-SC	-21.854914	120.131223	12	
Acacia aphanoclada	7/3/20	OPP-SC	-21.855475	120.13128	7	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85567	120.132629	3	
Acacia aphanoclada	7/3/20	OPP-SC	-21.855709	120.131758	5	
Acacia aphanoclada	7/3/20	OPP-SC	-21.855739	120.131419	4	
Acacia aphanoclada	7/3/20	OPP-SC	-21.855963	120.132334	4	
Acacia aphanoclada	7/3/20	OPP-SC	-21.856045	120.131887	1	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85626	120.132308	9	
Acacia aphanoclada	7/3/20	OPP-SC	-21.856417	120.132025	30	
Acacia aphanoclada	7/3/20	OPP-SC	-21.856746	120.132212	5	
Acacia aphanoclada	7/3/20	OPP-SC	-21.856889	120.132692	10	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85729	120.132897	9	

Not new pop. Within 500 m of WA Herb voucher (Sheet 6492231)

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-SC	-21.857325	120.133322	2	
Acacia aphanoclada	7/3/20	OPP-SC	-21.85785	120.133427	25	
Acacia aphanoclada	7/3/20	OPP-SC	-21.848566	120.131592	38	
Acacia aphanoclada	7/3/20	OPP-SC	-21.848754	120.13152	2	

Marble Bar Rd Upgrade **Site** MBU27

Described by SC **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203548 mE, 7580465 mN 120.131766°E, -21.854866°S

Habitat Medium undulating rocky hills, with dissecting drainage lines.

Soil Reddish brown clay loam.

Rock Type Hardey Formation; rhyodacite.

Vegetation *Acacia bivenosa* shrubland over *Triodia brizoides,* (*T. epactia, T. wiseana*) hummock grassland.

Veg Condition Excellent.

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.5	300	MBU27-03	NI=45.
Acacia bivenosa	12	110		
Acacia inaequilatera	0.1	50		
Acacia orthocarpa	0.5	110	MBU26-01=	PLDK: Bushy form.
Bulbostylis barbata	0.1	5		
Fimbristylis dichotoma	0.1	15	SC05=	PLDK: sens. lat.; styles wholly ciliate.
Maireana melanocoma	0.1	20	MBU02-05=	Dead; sterile.
Ptilotus calostachyus	0.1	60		
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.1	60	MBU27-04	
Senna glutinosa subsp. *glutinosa*	0.1	100		
Senna glutinosa subsp. *pruinosa*	0.1	80		
Tribulus suberosus	0.1	30		
Triodia brizoides	25	30	MBU27-01	
Triodia epactia	5	30	MBU26-03=	PLDK: sens. lat.
Triodia wiseana	1	30	MBU27-02	PLDK: sens. lat.; long lemma lobe form.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P1 New population: ☐

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 4.7 km northeast of Walters Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.852908 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.129532 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				25
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached. Within 500 m of known population (90682)

DRF PERMIT/ LICENCE No: FB62000037 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office [redacted] ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_05

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.849866	120.130038	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849908	120.129882	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849941	120.130211	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849949	120.130162	1	
Acacia aphanoclada	7/3/20	OPP-SC	-21.852908	120.129532	25	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849971	120.129862	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849977	120.13022	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849984	120.130113	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850011	120.130074	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850077	120.130227	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850098	120.129879	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850105	120.130275	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850152	120.129887	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850166	120.130158	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850354	120.130106	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850858	120.130511	1	West side of Marble Bar Road. Not a new population, within 500m of Vouchered Population 90682 (WAH).
Acacia aphanoclada	7/3/20	OPP-MM	-21.850866	120.130444	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850916	120.13021	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850942	120.130162	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.850989	120.130257	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851119	120.130448	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851146	120.130486	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85119	120.130389	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851215	120.130301	5	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851217	120.130388	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851226	120.130388	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851298	120.130387	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851306	120.130328	5	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851333	120.130337	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851361	120.130366	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851361	120.130395	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851407	120.130413	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851415	120.130346	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851488	120.130383	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851616	120.130487	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851632	120.13038	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.851663	120.130099	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851751	120.130474	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851787	120.129961	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851789	120.130077	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851797	120.130541	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851815	120.130502	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851842	120.13053	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851848	120.130337	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851859	120.130482	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851903	120.130413	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851923	120.130519	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851957	120.130393	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.851967	120.13046	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85204	120.130488	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852085	120.130477	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85211	120.130351	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852111	120.130428	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852185	120.130495	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852209	120.13033	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852221	120.130503	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852227	120.130329	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852239	120.130503	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852335	120.130298	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852431	120.130132	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852441	120.130209	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852443	120.130306	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852461	120.130305	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852466	120.130073	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852484	120.130063	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852486	120.130198	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852503	120.13013	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852504	120.130188	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85251	120.129985	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852522	120.130178	4	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85253	120.13012	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852538	120.130033	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852571	120.130419	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85258	120.130409	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852607	120.130418	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852631	120.130244	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852641	120.129751	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85271	120.130088	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852737	120.130097	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852747	120.130135	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85282	120.130201	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852822	120.130308	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.852857	120.130259	2	
Acacia aphanoclada	7/3/20	OPP-SC	-21.853494	120.129501	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.855734	120.130104	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.855798	120.130161	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.855835	120.130199	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85589	120.130217	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.855925	120.130197	4	
Acacia aphanoclada	7/3/20	OPP-MM	-21.855971	120.130235	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856001	120.130418	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856076	120.131103	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856082	120.130919	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856091	120.130871	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856099	120.130851	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856104	120.131151	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856102	120.130513	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856125	120.130774	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856149	120.131111	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85616	120.130715	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85619	120.130888	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856209	120.130946	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856212	120.13113	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856217	120.130888	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856277	120.130712	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856289	120.13136	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856307	120.131369	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856336	120.130953	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856343	120.131398	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856362	120.131446	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856363	120.130972	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856388	120.131358	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856406	120.131367	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856407	120.131435	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856407	120.131445	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856508	120.130998	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856516	120.13094	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856523	120.131346	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856525	120.130969	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856541	120.131355	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856543	120.130959	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856544	120.130988	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856553	120.131509	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856596	120.131373	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856635	120.131556	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856654	120.131595	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856762	120.131592	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85678	120.131602	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856825	120.131591	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856824	120.13103	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856871	120.13161	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856891	120.131735	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856892	120.131261	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856907	120.131135	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.856912	120.131406	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856918	120.131193	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856938	120.131347	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856956	120.131347	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856961	120.131588	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856962	120.131134	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856973	120.13124	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856973	120.131288	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856976	120.131414	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856982	120.131269	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856985	120.131414	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.856986	120.131511	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85699	120.131211	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85699	120.131211	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857002	120.131404	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857003	120.131442	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85703	120.131413	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85703	120.131432	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857034	120.131655	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857034	120.131664	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85708	120.131712	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857113	120.131537	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85713	120.131469	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85713	120.131488	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857132	120.131092	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857152	120.131198	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857167	120.131536	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857195	120.131071	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857229	120.131457	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857235	120.131254	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857293	120.131485	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857299	120.131872	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857301	120.131446	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857303	120.131543	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857332	120.131668	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857338	120.131484	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85736	120.131706	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857365	120.131484	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85737	120.131764	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857387	120.131696	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857404	120.131667	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857405	120.131715	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857451	120.131782	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857478	120.131249	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857497	120.131829	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857543	120.131354	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857595	120.131237	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857604	120.13175	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.857613	120.131749	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-SC	-21.857772	120.132568	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85796	120.131423	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858047	120.13175	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858047	120.13177	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858065	120.13175	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858078	120.13146	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858082	120.13174	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858089	120.131605	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858092	120.131759	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85811	120.131788	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858118	120.13171	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858118	120.13172	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858119	120.131778	4	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85812	120.131836	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858127	120.131681	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858128	120.131739	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858137	120.131778	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858138	120.131826	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858145	120.13169	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858146	120.131777	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858147	120.131797	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858148	120.131884	7	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858154	120.131719	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858158	120.131913	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858177	120.132502	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858174	120.131787	10	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858176	120.131903	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858181	120.131699	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858186	120.13197	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858194	120.131902	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858201	120.131815	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858202	120.131844	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858203	120.131941	4	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858218	120.131766	9	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858221	120.131921	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858228	120.131805	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858233	120.132066	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858293	120.132432	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858406	120.132198	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858431	120.132081	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858443	120.132207	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858467	120.132032	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85847	120.132206	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858475	120.131993	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858477	120.132129	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858504	120.13208	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858506	120.132196	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858513	120.13264	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858511	120.132002	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.858531	120.132601	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858584	120.132533	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858604	120.132145	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858605	120.132174	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858607	120.13229	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858654	120.132396	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858828	120.132025	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858834	120.131851	7	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858844	120.131938	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858854	120.131995	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858855	120.132053	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858859	120.131734	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858869	120.132304	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858874	120.132121	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858883	120.132111	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858888	120.132362	9	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858895	120.132246	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858906	120.132362	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858911	120.132168	10	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858916	120.13242	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858921	120.132187	4	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858924	120.13239	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858968	120.132341	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858974	120.132138	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858981	120.132031	8	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858983	120.132157	7	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858992	120.132109	3	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858995	120.132292	5	
Acacia aphanoclada	7/3/20	OPP-MM	-21.858998	120.131963	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859003	120.132224	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859298	120.132112	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859336	120.132198	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859372	120.132178	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859418	120.132245	10	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859426	120.132168	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859435	120.132167	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859455	120.132273	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859599	120.132261	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859635	120.13225	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859653	120.132269	6	
Acacia aphanoclada	7/3/20	OPP-MM	-21.85969	120.132288	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859725	120.132258	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859725	120.132268	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859733	120.132162	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859815	120.132228	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859816	120.132266	2	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859833	120.132218	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859852	120.132256	13	
Acacia aphanoclada	7/3/20	OPP-MM	-21.859897	120.132255	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	7/3/20	OPP-MM	-21.859951	120.132235	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.860046	120.132523	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849725	120.130225	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849777	120.130108	1	
Acacia aphanoclada	7/3/20	OPP-MM	-21.849822	120.130087	2	

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 4.2 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.859875 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.133077 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				4
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office [redacted] ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

All habitat and vegetation details described in the attached TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_06

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	7/3/20	OPP-SC	-21.858475	120.133018	3
Acacia aphanoclada	7/3/20	OPP-MM	-21.85879	120.132954	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.85882	120.133137	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.858827	120.133021	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.858921	120.133241	2
Acacia aphanoclada	7/3/20	OPP-MM	-21.859316	120.133117	4
Acacia aphanoclada	7/3/20	OPP-MM	-21.859407	120.133145	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.859528	120.133384	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.859912	120.133125	2
Acacia aphanoclada	7/3/20	OPP-MM	-21.859978	120.133269	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.859995	120.13323	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.860187	120.132849	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.860194	120.132713	1
Acacia aphanoclada	7/3/20	OPP-MM	-21.859875	120.133077	4

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximatley 3.7 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.864352 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.131015 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count Method: Estimate

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				5
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				5

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☒	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Colluvium		Silty loam		
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Senna symonii, Acacia synchronicia, Sclerolaena densiflora, Maireana melanocoma

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Quadrat data and additional records for this population are attached

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Quadrat data, additional records.

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF). The habitat and vegetation details described in the TPRF also apply to these records.

One quadrat recorded by Biota (MBU33) was associated with this population. Quadrat data is also attached.

Biota TPRF reference: 1509_ACAaph_TPRF_07

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.862585	120.131621	1
Acacia aphanoclada	15/3/20	OPP-AL	-21.863885	120.130647	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.863944	120.130907	5
Acacia aphanoclada	8/3/20	MBU33	-21.864352	120.131015	0.1% cover

Marble Bar Rd Upgrade **Site** MBU33

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203480 mE, 7579455 mN 120.130926°E, -21.863968°S

Habitat Gentle slope (E-facing).

Soil Red (2.5YR 4/6) silty loam.

Rock Type Colluvium.

Vegetation *Triodia brizoides* hummock grassland.

Veg Condition Very Good: cattle scats, tracks.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.1	110		N=5. Number not recorded; estimated.
Acacia synchronicia	0.1	220	MBU33-04	Shrub. PLDK: sens. lat.
Eucalyptus leucophloia subsp. *leucophloia*	0.1	140		Straggly. Other Euc leucs outside quadrat are 400cm tall.
Maireana carnosa	0.1	15	MBU33-05	M Hislop (WAH): Tentative ID of sterile specimen.
Maireana melanocoma	0.1	30	MBU33-01	
Pluchea tetranthera	0.1	100		1 plant in slight depression.
Salsola australis	0.1	40		Dead.
Sclerolaena densiflora	0.1	15	MBU33-03	PLDK: sens. lat.; mostly sterile or immature fruits.
Senna symonii	0.1	200		
Triodia brizoides	60	50	MBU33-02	
Triodia longiceps	0.5	110	MBU33-06	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 3.6 km northeast of Walters Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.864198 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.129955 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				5
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_08

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.8642	120.129955	5	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.86424	120.130157	5	Recruitment observed
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.86425	120.130147	5	

Marble Bar Rd Upgrade **Site** MBU33

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203480 mE, 7579455 mN 120.130926°E, -21.863968°S

Habitat Gentle slope (E-facing).

Soil Red (2.5YR 4/6) silty loam.

Rock Type Colluvium.

Vegetation *Triodia brizoides* hummock grassland.

Veg Condition Very Good: cattle scats, tracks.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.1	110		N=5. Number not recorded; estimated.
Acacia synchronicia	0.1	220	MBU33-04	Shrub. PLDK: sens. lat.
Eucalyptus leucophloia subsp. *leucophloia*	0.1	140		Straggly. Other Euc leucs outside quadrat are 400cm tall.
Maireana carnosa	0.1	15	MBU33-05	M Hislop (WAH): Tentative ID of sterile specimen.
Maireana melanocoma	0.1	30	MBU33-01	
Pluchea tetranthera	0.1	100		1 plant in slight depression.
Salsola australis	0.1	40		Dead.
Sclerolaena densiflora	0.1	15	MBU33-03	PLDK: sens. lat.; mostly sterile or immature fruits.
Senna symonii	0.1	200		
Triodia brizoides	60	50	MBU33-02	
Triodia longiceps	0.5	110	MBU33-06	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Simon Colwill **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 2.8 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.870665 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.127059 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				78
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals:				
Alive				78

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Mosquito Creek Formation; wacke/shale?				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Low isolated trees (Eucalyptus leucophloia subsp. leucophloia)
2. Tall isolated shrubs (Acacia aphanoclada, Senna artemisioides subsp. oligophylla x S. symonii)
3. Isolated shrubs (Acacia bivenosa)
4. Hummock grassland (Triodia brizoides)

ASSOCIATED SPECIES:

Other (non-dominant) spp

Ptilotus astrolasius, Acacia hilliana, Hakea lorea subsp. lorea, Indigofera monophylla, Pluchea tetranthera

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Quadrat data and additional records for this population are attached

DRF PERMIT/ LICENCE No: FB62000037 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Quadrat data, additional records.

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF). The habitat and vegetation details described in the TPRF also apply to these records.

There was also one quadrat sampled by Biota (MBU28) that was within this population. Quadrat data is also attached.

Biota TPRF reference: 1509_ACAaph_TPRF_09

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.869138	120.128009	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.869417	120.127433	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.869663	120.127553	25
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.869863	120.127153	5
Acacia aphanoclada	8/3/20	OPP-MM	-21.870114	120.127583	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.870293	120.126941	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870302	120.12696	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.870333	120.127163	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.870346	120.126863	1
Acacia aphanoclada	15/3/20	OPP-BrM	-21.870374	120.12693	5
Acacia aphanoclada	8/3/20	OPP-MM	-21.870387	120.127142	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.870468	120.12716	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870516	120.127304	10
Acacia aphanoclada	8/3/20	OPP-MM	-21.870645	120.127456	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870645	120.127456	20
Acacia aphanoclada	8/3/20	OPP-MM	-21.870662	120.127408	1
Acacia aphanoclada	8/3/20	MBU28	-21.870665	120.127059	78
Acacia aphanoclada	8/3/20	OPP-MM	-21.870697	120.127359	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.87082	120.126612	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87082	120.126621	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.870848	120.126679	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870884	120.127219	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870885	120.126755	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870921	120.126706	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870931	120.126783	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.870938	120.126677	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87094	120.126774	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.87094	120.126812	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87096	120.12687	5
Acacia aphanoclada	8/3/20	OPP-MM	-21.871009	120.126617	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.871009	120.126617	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.871015	120.126965	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87102	120.126704	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.871024	120.126917	3

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-MM	-21.871025	120.127004	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.871025	120.127014	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.871029	120.126685	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.871033	120.126926	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.871042	120.126936	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.87161	120.126373	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.871754	120.126351	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.871764	120.126419	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87187	120.126794	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.871887	120.126764	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.871905	120.126735	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.871949	120.126695	5
Acacia aphanoclada	8/3/20	OPP-MM	-21.872002	120.126627	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872003	120.126685	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872023	120.1268	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.87205	120.126268	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872062	120.126413	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872068	120.126277	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.872093	120.126625	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872124	120.12585	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872137	120.126092	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872148	120.126169	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.872202	120.126149	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873094	120.125551	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.87312	120.125511	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873129	120.125492	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873129	120.125521	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873137	120.125414	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873138	120.125521	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873156	120.125501	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873157	120.12553	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873157	120.12553	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.873176	120.125578	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.873192	120.12551	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.873194	120.125587	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.873238	120.125519	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873277	120.125702	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873279	120.125818	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873285	120.125653	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873318	120.125478	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.87332	120.125594	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.873338	120.125584	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873346	120.125507	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873393	120.125603	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.87349	120.125504	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.873544	120.125464	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873544	120.125503	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873548	120.125203	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.873611	120.125163	1

Marble Bar Rd Upgrade **Site** MBU28

Described by SC **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203086 mE, 7578748 mN 120.126990°E, -21.870281°S

Habitat Low undulating hills.

Soil Reddish brown clay loam.

Rock Type Mosquito Creek Formation; wacke/shale?

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia aphanoclada, Senna artemisioides* subsp. *oligophylla* x *S. symonii* scattered tall shrubs over *A. bivenosa* scattered shrubs over *Triodia brizoides* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Small hill; larger area of drainage to the E is dominated by *Acacia trachycarpa* scrub over *Triodia longiceps* and *T. epactia.*

Species	Cover	Height	Specimen	Notes
Acacia aphanoclada	0.5	350	MBU27-03=	NI=78.
Acacia bivenosa	1	150		
Acacia hilliana	0.1	60	MBU28-01	
Acacia synchronicia	0.1	150	MBU28-04	PLDK: sens. lat.
Bulbostylis barbata	0.1	5		
Eriachne pulchella	0.1	5		
Eucalyptus leucophloia subsp. *leucophloia*	0.1	400	MBU28-03	Overhanging; rooted outside quadrat.
Fimbristylis simulans	0.1	5	SC21=	
Grevillea wickhamii subsp. *hispidula*	0.1	120		Sterile; subsp. applied from flowering collections.
Hakea lorea subsp. *lorea*	0.1	70		
Indigofera monophylla	0.1	110	MBU28-02	PLDK: sens. lat.
Pluchea tetranthera	0.1	30	MBU25-08=	
Ptilotus astrolasius	0.1	20	SC22=	
Senna artemisioides subsp. *oligophylla* x *S. symonii*	0.5	200	MBU27-04=	
Senna glutinosa subsp. *glutinosa*	0.1	200		
Sporobolus australasicus	0.1	5		
Tribulus suberosus	0.1	30		
Trigastrotheca molluginea	0.1	10		
Triodia brizoides	40	30	MBU27-01=	
Triodia longiceps	0.1	40		
Triodia wiseana	0.1	20	MBU27-02=	PLDK: sens. lat.; long lemma lobe form.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 2.4 km northeast of Walters Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.873748 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.124242 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				13
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

Record entered by: **Sheet No.:** **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_10

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	8/3/20	OPP-MM	-21.870967	120.125758	2	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871128	120.125648	2	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871178	120.125444	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871232	120.125414	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871294	120.125335	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871295	120.125422	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871302	120.125287	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871304	120.125383	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871319	120.125228	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.87132	120.125306	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871328	120.125247	1	Western side of Marble Bar Road
Acacia aphanoclada	8/3/20	OPP-MM	-21.87133	120.125354	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871331	120.125383	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871339	120.125325	2	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871349	120.125373	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871375	120.125334	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871402	120.125323	1	
Acacia aphanoclada	8/3/20	OPP-MM	-21.871617	120.125213	1	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.873482	120.124537	4	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.873748	120.124242	13	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.87412	120.123857	1	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.874612	120.123557	2	
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.874721	120.123603	2	

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 1.1 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.879908 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.11465 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				23
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT: Some individuals located in intact vegettaion and others within mostly cleared areas/roadside vegetation.

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_11

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877404	120.120638	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877422	120.120638	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877455	120.121005	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877464	120.120976	15
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877466	120.120579	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877475	120.12055	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877492	120.121033	4
Acacia aphanoclada	14/3/20	OPP-MM	-21.877498	120.120878	3
Acacia aphanoclada	14/3/20	OPP-MM	-21.877499	120.120907	2
Acacia aphanoclada	14/3/20	OPP-MM	-21.877525	120.120878	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877562	120.120916	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877586	120.120219	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877588	120.120325	3
Acacia aphanoclada	14/3/20	OPP-MM	-21.877634	120.120885	2
Acacia aphanoclada	14/3/20	OPP-MM	-21.87769	120.120991	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877702	120.121155	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877702	120.121184	3
Acacia aphanoclada	14/3/20	OPP-MM	-21.877749	120.121299	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.877743	120.12039	7
Acacia aphanoclada	14/3/20	OPP-MM	-21.877832	120.121365	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877849	120.121345	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877896	120.121422	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877905	120.121402	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877905	120.121421	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877914	120.121412	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.877984	120.121284	1

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	14/3/20	OPP-MM	-21.8781	120.121737	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.87836	120.119575	2
Acacia aphanoclada	14/3/20	OPP-MM	-21.878436	120.12084	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878501	120.121932	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878612	120.121088	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878638	120.120004	6
Acacia aphanoclada	14/3/20	OPP-MM	-21.878694	120.121609	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878694	120.121115	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.87871	120.121541	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878747	120.12154	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878757	120.121627	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878757	120.121636	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.878783	120.121046	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.879065	120.120673	1
Acacia aphanoclada	14/3/20	OPP-MM	-21.879074	120.120673	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879326	120.116509	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.87951	120.115132	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879564	120.116156	9
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879645	120.114617	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879775	120.115862	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879908	120.11465	23
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.879992	120.115877	15
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.88007	120.114144	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880096	120.114095	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880199	120.114287	25
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880295	120.11412	5
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880409	120.113876	19

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 1.4 km northeast of Walters Street in Nullagine, on the northwestern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.878573 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.116785 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

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

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 1.5 km northeast of Walters Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.882672 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.112738 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count Method: Estimate

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				5
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 35x65 Data attached ☒ Total area of quadrats (m^2): 2275

Summary Quad. Totals: Alive				5

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Shale (poorly metamorphosed); mapped as ferruginous duricrust.		Silty loam	Dark red	
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia aphanoclada)
2. Isolated shrubs (Acacia bivenosa)
3. Low isolated shrubs (Indigofera monophylla)
4. Hummock grassland (Triodia epactia, T. wiseana)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Cymbopogon ambiguus, Acacia hilliana, Acacia adoxa var. adoxa, Goodenia cusackiana, Senna glutinosa subsp. glutinosa

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Quadrat data and additional records for this population are attached

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Quadrat data, additional records.

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF). The habitat and vegetation details described in the TPRF also apply to these records.

There was one quadrat sampled by Biota (MBU41) within the population. Quadrat data is attached.

Biota TPRF reference: 1509_ACAaph_TPRF_13

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880694	120.113687	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881218	120.113715	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881305	120.11352	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881368	120.114012	6
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881391	120.113818	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881866	120.113576	8
Acacia aphanoclada	8/3/20	OPP-AL	-21.882381	120.112628	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882389	120.112531	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882548	120.112885	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.882556	120.112827	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882592	120.112768	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882594	120.112933	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.882611	120.112874	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.882645	120.1127	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.882648	120.112903	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.882652	120.112632	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.882663	120.112738	2
Acacia aphanoclada	8/3/20	MBU41	-21.882672	120.112738	0.1% cover
Acacia aphanoclada	8/3/20	OPP-AL	-21.882684	120.112892	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.88269	120.112708	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.8827	120.112757	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.882708	120.112718	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.882719	120.112833	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882785	120.112484	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882786	120.112552	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882813	120.112532	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882828	120.112889	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.882835	120.112734	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.88311	120.112458	6
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883169	120.112747	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883418	120.112026	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883476	120.112257	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883504	120.112789	5
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883534	120.111976	5

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883606	120.112458	1

Marble Bar Rd Upgrade **Site** MBU41

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 35 x 65 m

MGA Zone 51 201624 mE, 7577388 mN 120.112610°E, -21.882306°S

Habitat Crest and upper slopes of a rounded low hill.

Soil Dark red (2.5YR 3/6) silty loam.

Rock Type Shale (poorly metamorphosed); mapped as ferruginous duricrust.

Vegetation *Acacia aphanoclada* scattered tall shrubs over *A. bivenosa* scattered shrubs over *Indigofera monophylla* scattered low shrubs over *Triodia epactia, (T. wiseana)* hummock grassland.

Veg Condition Excellent.

Fire Age No sign of recent fire.

Notes Small patch of *Triodia wiseana* (10 x 5 m) on very crest.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	60	MBU41-14	
Acacia adoxa var. *adoxa*	0.1	70	MBU41-06	
Acacia aphanoclada	0.1	450		N=5. Number not recorded; estimated. Recruitment noted.
Acacia aphanoclada x pyrifolia var. *pyrifolia*	0.1	12	MBU41-17	
Acacia bivenosa	0.1	200	MBU41-10	Bushy. PLDK: sens. lat.
Acacia hilliana	0.1	100	MBU41-01	Spreading shrub.
Acacia inaequilatera	0.1	200	MBU41-13	
Bonamia pilbarensis	0.1	5	MBU41-03	
Cassytha capillaris	0.1	40		Spreading to 1m across.
Corchorus parviflorus	0.1	20	MBU41-11	
Cymbopogon ambiguus	0.1	90	MBU41-04	
Eriachne mucronata (typical form)	0.1	40	MBU41-16	
Eucalyptus leucophloia subsp. *leucophloia*	0.1	400		
Goodenia cusackiana	0.1	25	MBU41-18	
Hibiscus coatesii	0.1	30	MBU41-02	Spindly.
Indigofera monophylla	0.1	45	MBU41-07	Greyish leaflets. PLDK: sens. lat.
Polygala glaucifolia	0.1	2	MBU41-05	
Ptilotus exaltatus	0.1	2		
Senna glutinosa subsp. *glutinosa*	0.1	220	MBU41-15	MET det.
Senna glutinosa subsp. *glutinosa x* subsp. x *luerssenii*	0.1	110	MBU41-09	Very slightly sticky. MET det.
Senna symonii	0.1	30		
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	0.1	20	MBU41-12	Orange flowers.
Tribulus hirsutus	0.1	10	MBU41-19	
Triodia epactia	30	50	MBU41-20	PLDK: sens. lat.
Triodia wiseana	5	40	MBU41-08	PLDK: sens. lat.; long lemma lobe form.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 350 m northeast of Walters Street in Nullagine, on the northern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.884346 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.110402 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT: Some individuals located in intact vegettaion and others within mostly cleared areas/roadside vegetation.

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_14

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.88035	120.113607	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.883944	120.111648	5
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884123	120.111567	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884134	120.110658	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884228	120.110347	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884346	120.110402	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884355	120.110392	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884576	120.111665	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885028	120.11065	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885208	120.111159	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885432	120.110061	37

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 660 m northeast of Walters Street in Nullagine, on the northwestern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.882578 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.112005 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				2
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_15

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880061	120.11308	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880156	120.113359	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880389	120.113277	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.880618	120.112934	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881135	120.112575	5
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881262	120.112079	19
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881489	120.112665	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881645	120.112855	6
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.881732	120.112109	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882009	120.1125	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882454	120.112123	4
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882578	120.112005	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882754	120.11175	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882891	120.111834	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.882915	120.11165	2
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884418	120.10985	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884483	120.109964	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884611	120.109527	4
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884845	120.10899	1
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884886	120.109289	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884958	120.109781	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.884949	120.108717	16
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885034	120.109489	7
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885077	120.109333	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885091	120.10913	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885093	120.108724	3
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885098	120.108985	5
Acacia aphanoclada	15/3/20	OPP-ALBrM	-21.885324	120.108535	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☐

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 1.8 km south southeast of Walter Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.900132 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.11493 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				4
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached. Within 500 m of known population (90684).

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office [redacted] ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_17

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	14/3/20	OPP-MM	-21.896139	120.115803	6	
Acacia aphanoclada	14/3/20	OPP-MM	-21.896184	120.115764	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.898003	120.113967	30	Not a new population. Within 500 m of vouchered record Pop90684
Acacia aphanoclada	15/3/20	OPP-RM	-21.900099	120.11464	3	
Acacia aphanoclada	15/3/20	OPP-RM	-21.900132	120.11493	4	
Acacia aphanoclada	15/3/20	OPP-RM	-21.900397	120.114605	3	
Acacia aphanoclada	15/3/20	OPP-RM	-21.901227	120.115091	3	
Acacia aphanoclada	15/3/20	OPP-RM	-21.902421	120.115241	15	
Acacia aphanoclada	15/3/20	OPP-RM	-21.903621	120.115246	15	
Acacia aphanoclada	15/3/20	OPP-RM	-21.904118	120.115285	5	

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 1.5 km south southeast of Walter Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.898139 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.113529 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				4
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_18

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-AL	-21.897993	120.113435	7
Acacia aphanoclada	8/3/20	OPP-AL	-21.898031	120.113521	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.898041	120.11356	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898046	120.113356	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.898067	120.113549	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898068	120.113578	8
Acacia aphanoclada	8/3/20	OPP-AL	-21.898074	120.113414	5
Acacia aphanoclada	8/3/20	OPP-AL	-21.898085	120.11351	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898086	120.113578	4
Acacia aphanoclada	8/3/20	OPP-AL	-21.8981	120.113326	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.8981	120.113346	3
Acacia aphanoclada	15/3/20	OPP-RM	-21.898115	120.113674	30
Acacia aphanoclada	8/3/20	OPP-AL	-21.89812	120.113461	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.898122	120.113568	7
Acacia aphanoclada	8/3/20	OPP-AL	-21.898128	120.113384	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898132	120.113606	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898139	120.113529	4
Acacia aphanoclada	8/3/20	OPP-AL	-21.898142	120.113693	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898163	120.113315	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898178	120.113683	5
Acacia aphanoclada	8/3/20	OPP-AL	-21.898197	120.113731	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898209	120.113392	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898238	120.113478	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898242	120.11372	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898264	120.113449	3
Acacia aphanoclada	8/3/20	OPP-AL	-21.898286	120.113661	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.898318	120.113409	6
Acacia aphanoclada	8/3/20	OPP-AL	-21.898334	120.113805	9
Acacia aphanoclada	8/3/20	OPP-AL	-21.898339	120.113612	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.898384	120.113611	2
Acacia aphanoclada	8/3/20	OPP-AL	-21.89841	120.113533	6
Acacia aphanoclada	8/3/20	OPP-AL	-21.898436	120.113474	10
Acacia aphanoclada	8/3/20	OPP-AL	-21.898446	120.113532	1
Acacia aphanoclada	8/3/20	OPP-AL	-21.898472	120.113454	6
Acacia aphanoclada	15/3/20	OPP-JK	-21.900265	120.114289	1

Biota [n]: The living creatures of an area; the flora and fauna together

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 2.4 km south of Walter Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.906771 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.110579 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				30
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

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

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

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

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

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

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

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

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_19

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-RM	-21.905217	120.111007	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.906341	120.1108	20
Acacia aphanoclada	15/3/20	OPP-JK	-21.906771	120.110579	30
Acacia aphanoclada	15/3/20	OPP-JK	-21.907572	120.110456	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.907632	120.110774	15

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 3.3 km south southeast of Walter Street in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.913483 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.114003 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				2
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

•			

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

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

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 5.3 km south of Walter Street in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.930683 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.109138 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				2
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

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

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

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

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

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

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

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

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

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

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_21

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-RM	-21.926036	120.110731	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.926198	120.111231	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.926223	120.111115	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.926338	120.110996	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.926369	120.111228	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.926545	120.110934	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.926573	120.11103	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.926646	120.111077	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926647	120.111125	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926674	120.111125	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926789	120.110977	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926906	120.110946	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926926	120.111071	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.926935	120.111052	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.927106	120.111019	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.927141	120.110941	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.927159	120.110941	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.927169	120.111018	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.929574	120.110196	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.929711	120.109777	50
Acacia aphanoclada	8/3/20	OPP-MM	-21.92976	120.110008	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.929849	120.109919	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.929966	120.109404	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930007	120.109171	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930027	120.109296	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930043	120.10918	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.930082	120.109847	4
Acacia aphanoclada	15/3/20	OPP-JK	-21.930111	120.108946	20
Acacia aphanoclada	8/3/20	OPP-MM	-21.930123	120.10913	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.930124	120.109188	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930137	120.109372	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.930184	120.109999	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930184	120.109467	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930186	120.109071	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93023	120.109031	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93024	120.109582	1

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-MM	-21.930258	120.109621	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930296	120.109697	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93031	120.108962	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.930323	120.109697	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930332	120.109706	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930347	120.109532	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.930348	120.109561	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930356	120.109532	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930368	120.109173	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930372	120.109406	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930437	120.109501	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93044	120.109182	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930449	120.109152	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930453	120.109414	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930467	120.109171	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930471	120.109374	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930481	120.109432	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930531	120.109189	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930534	120.109383	3
Acacia aphanoclada	15/3/20	OPP-RM	-21.930536	120.109489	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.93054	120.109189	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93056	120.109295	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93057	120.109382	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930579	120.10885	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930604	120.109236	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930613	120.109236	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930683	120.109138	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930708	120.109021	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.93071	120.109118	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930719	120.109147	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930756	120.109146	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930758	120.109301	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930767	120.109301	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930813	120.10931	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930815	120.109426	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930815	120.109455	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930824	120.109445	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930831	120.109319	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930833	120.109416	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930836	120.108603	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930865	120.108709	4
Acacia aphanoclada	15/3/20	OPP-JK	-21.930891	120.109134	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.93089	120.108602	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930908	120.108572	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930936	120.109114	3
Acacia aphanoclada	15/3/20	OPP-JK	-21.930944	120.109104	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.930955	120.10921	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930957	120.108813	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.930964	120.1092	1

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-MM	-21.930977	120.108919	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.930992	120.108745	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.931009	120.108686	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.931011	120.108802	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.931012	120.108851	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.931017	120.108628	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.931022	120.108918	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.931025	120.109044	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.931033	120.109025	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.932181	120.108585	5
Acacia aphanoclada	15/3/20	OPP-RM	-21.932225	120.108526	15
Acacia aphanoclada	15/3/20	OPP-RM	-21.932274	120.108729	7
Acacia aphanoclada	15/3/20	OPP-RM	-21.932332	120.108466	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.932372	120.108669	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.932429	120.108309	10
Acacia aphanoclada	15/3/20	OPP-RM	-21.932532	120.10852	9
Acacia aphanoclada	15/3/20	OPP-JK	-21.932661	120.108169	6
Acacia aphanoclada	15/3/20	OPP-JK	-21.932761	120.108206	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.932765	120.108438	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.932789	120.108263	6
Acacia aphanoclada	15/3/20	OPP-JK	-21.932859	120.108136	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.93286	120.108185	3
Acacia aphanoclada	15/3/20	OPP-JK	-21.93287	120.108252	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.932895	120.108107	4
Acacia aphanoclada	15/3/20	OPP-JK	-21.932956	120.108028	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.932966	120.108057	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.932976	120.108105	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.932992	120.107979	4
Acacia aphanoclada	15/3/20	OPP-JK	-21.93304	120.108142	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.933066	120.108074	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.933093	120.108112	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.934942	120.106972	3
Acacia aphanoclada	15/3/20	OPP-RM	-21.935037	120.106747	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.935219	120.106308	7
Acacia aphanoclada	15/3/20	OPP-RM	-21.935278	120.107081	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.935292	120.106365	5
Acacia aphanoclada	15/3/20	OPP-RM	-21.935339	120.106964	10
Acacia aphanoclada	15/3/20	OPP-JK	-21.935568	120.106176	3
Acacia aphanoclada	15/3/20	OPP-JK	-21.935671	120.106386	5
Acacia aphanoclada	15/3/20	OPP-RM	-21.935706	120.106831	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.935712	120.106124	15
Acacia aphanoclada	15/3/20	OPP-RM	-21.935797	120.106848	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.935819	120.106035	6
Acacia aphanoclada	15/3/20	OPP-JK	-21.935893	120.10613	8
Acacia aphanoclada	15/3/20	OPP-RM	-21.935983	120.10667	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.935985	120.106225	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936002	120.106176	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936028	120.106108	5
Acacia aphanoclada	15/3/20	OPP-RM	-21.936189	120.106579	1

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-JK	-21.936299	120.106151	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936337	120.106276	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936407	120.106139	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936419	120.106313	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.936486	120.106515	1
Acacia aphanoclada	15/3/20	OPP-JK	-21.936532	120.10605	2
Acacia aphanoclada	15/3/20	OPP-RM	-21.936593	120.106435	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.936639	120.105951	10
Acacia aphanoclada	15/3/20	OPP-JK	-21.936646	120.105873	2
Acacia aphanoclada	15/3/20	OPP-JK	-21.936741	120.106113	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☐

OBSERVER/S Rachel Warner **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximatley 6.3 km south of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.938819 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.106255 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count Method: Estimate

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				40
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				40

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☒	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☒	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Low isolated trees (Eucalyptus leucophloia subsp. leucophloia)
2. Tall isolated shrubs (Acacia aphanoclada)
3. Isolated shrubs (Acacia synchronicia, A. bivenosa)
4. Open hummock grassland (Triodia longiceps)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Sclerolaena eriacantha, Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90), Heliotropium chrysocarpum, Senna symonii, Trianthema triquetrum

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached. Within 500 m of WAH voucher (sheet 7808968).

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

One quadrat sampled by Biota (MBU38) was within this population. Quadrat data is also provided.

Biota TPRF reference: 1509_ACAaph_TPRF_22

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	15/3/20	OPP-RM	-21.938005	120.106117	2	Not a new population; within 500 m of vouchered population Sheet 7808968
Acacia aphanoclada	15/3/20	OPP-JK	-21.938075	120.106009	2	
Acacia aphanoclada	15/3/20	OPP-RM	-21.938085	120.106086	5	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938102	120.106008	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938111	120.105989	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.93812	120.106017	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105969	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938128	120.105979	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.93813	120.106075	10	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938146	120.105959	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938155	120.105959	2	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938164	120.105968	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938164	120.105968	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938182	120.105948	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938182	120.105958	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938228	120.105977	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938244	120.10588	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.938255	120.105976	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.938309	120.105975	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.938344	120.105916	1	
Acacia aphanoclada	8/3/20	MBU38	-21.938819	120.106255	0.5% cover	
Acacia aphanoclada	15/3/20	OPP-JK	-21.939693	120.106634	7	
Acacia aphanoclada	15/3/20	OPP-JK	-21.939743	120.106449	15	
Acacia aphanoclada	15/3/20	OPP-JK	-21.93975	120.106294	5	
Acacia aphanoclada	15/3/20	OPP-JK	-21.93983	120.106757	20	
Acacia aphanoclada	15/3/20	OPP-JK	-21.939841	120.10635	1	

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	15/3/20	OPP-JK	-21.93992	120.106213	15	
Acacia aphanoclada	15/3/20	OPP-JK	-21.939949	120.106309	2	
Acacia aphanoclada	15/3/20	OPP-JK	-21.939982	120.106164	5	
Acacia aphanoclada	15/3/20	OPP-JK	-21.940074	120.106229	1	
Acacia aphanoclada	15/3/20	OPP-JK	-21.940098	120.106587	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940135	120.106122	10	
Acacia aphanoclada	15/3/20	OPP-JK	-21.940149	120.106421	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940288	120.106128	17	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940417	120.106242	10	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940455	120.106367	5	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940491	120.105844	15	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940581	120.106316	20	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940699	120.105878	20	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940705	120.106217	7	
Acacia aphanoclada	15/3/20	OPP-RM	-21.940752	120.106342	10	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941043	120.105949	20	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941115	120.105908	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941167	120.106285	2	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941189	120.105994	20	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941328	120.106243	4	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941452	120.106085	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941472	120.106211	1	
Acacia aphanoclada	15/3/20	OPP-RM	-21.941572	120.106238	3	

Marble Bar Rd Upgrade **Site** MBU38

Described by RW,RM **Date** 08-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201057 mE, 7571145 mN 120.105990°E, -21.938540°S

Habitat Lower slope, undulating plain.

Soil Reddish brown (5YR 4/4) sandy loam.

Rock Type Mosquito Creek Formation; quartz, ?basalt.

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia aphanoclada* scattered tall shrubs over *A. synchronicia, A. bivenosa* scattered shrubs over *Triodia longiceps* open hummock grassland.

Veg Condition Excellent: old track in quadrat, but no impacts on vegetation.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Abutilon sp.	0.1	3	MBU38-11	Juvenile; inadequate material.
Acacia aphanoclada	0.5	400	MBU38-01	NI=40. Number not recorded; estimated.
Acacia aphanoclada x pyrifolia var. *pyrifolia*	0.1	230	MBU38-13	
Acacia bivenosa	1	120		
Acacia synchronicia	1	200	MBU38-12	PLDK: sens. lat.
**Aerva javanica*	0.1	35		NI=1.
Corchorus parviflorus	0.1	30	MBU38-07	
Cucumis variabilis	0.1	110		
Enneapogon caerulescens	0.1	20	MBU38-06	
Eucalyptus leucophloia subsp. *leucophloia*	0.5	320		
Euphorbia biconvexa	0.1	10	MBU38-09	
Heliotropium chrysocarpum	0.1	30	MBU38-04	
Ptilotus clementii	0.1	3		
Ptilotus exaltatus	0.1	20	MBU38-05	
Salsola australis	0.1	5		
Sclerolaena eriacantha	0.1	20	MBU38-02	
Senna glutinosa subsp. *x luerssenii*	0.1	120	MBU38-08	
Senna symonii	0.1	140	MBU38-03	
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	15	MBU38-10	PLDK: white indumentum form.
Sporobolus australasicus	0.1	5		
Trianthema triquetrum	0.1	10	MBU37-17=	
Tribulus hirsutus	0.1	5		
Triodia longiceps	26	50		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 15/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 9.0 km south of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

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

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

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.961568

Long / Easting: 120.103346

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				4
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs to tall sparse shrubland (Acacia inaequilatera)
2. Hummock grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
One additional record for this population is attached.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_23

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	15/3/20	OPP-RM	-21.96132	120.10357	1
Acacia aphanoclada	15/3/20	OPP-RM	-21.96157	120.10335	4

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 9.7 km south of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.966411 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.105667 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				15
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall sparse shrubland (Acacia inaequilatera)
2. Hummock grassland (Triodia wiseana, T. epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_24

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-MM	-21.96587	120.105155	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965903	120.105493	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965916	120.105222	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965943	120.105241	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965951	120.105696	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965971	120.105763	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965984	120.105008	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966005	120.105656	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966011	120.104988	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966382	120.105532	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.96641	120.105618	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966411	120.105667	15
Acacia aphanoclada	8/3/20	OPP-MM	-21.966462	120.105501	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.966494	120.10523	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966502	120.105181	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.966562	120.104986	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.96658	120.105015	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966601	120.10515	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966635	120.105062	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966663	120.10511	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.966692	120.105187	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966782	120.105185	6
Acacia aphanoclada	8/3/20	OPP-MM	-21.966881	120.105173	1
Acacia aphanoclada	14/3/20	OPP-RM	-21.967199	120.104761	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.96733	120.104516	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.967356	120.104477	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.967394	120.104582	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.967403	120.104553	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.96742	120.104514	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 10/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 10.4 km south of Walter Road in Nullagine, on the northwestern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.972136 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.099135 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				47
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☒	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Mosquito Creek Formation; ?siltstone, shale.		Silty clay loam		
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall sparse shrubland (Acacia inaequilatera, A. aphanoclada)
2. Open hummock grassland (Triodia wiseana, T. epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Senna artemisioides subsp. oligophylla, Gossypium australe, Indigastrum parviflorum, Tribulus suberosus, Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356) PN

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_25

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.971555	120.099969	25
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.971907	120.099991	20
Acacia aphanoclada	10/3/20	MBU-REL10	-21.972136	120.099135	47
Acacia aphanoclada	14/3/20	OPP-RM	-21.965615	120.104531	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965823	120.104556	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965834	120.104169	7
Acacia aphanoclada	8/3/20	OPP-MM	-21.965891	120.104342	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965895	120.104555	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965896	120.104594	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965936	120.104283	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.96594	120.104554	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965945	120.104293	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965972	120.104311	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.965983	120.104437	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.965985	120.104524	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.965999	120.10432	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966029	120.104475	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966037	120.104426	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966082	120.104377	4
Acacia aphanoclada	8/3/20	OPP-MM	-21.966091	120.104425	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966119	120.104473	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966125	120.10427	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966147	120.104521	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.96618	120.10332	10
Acacia aphanoclada	14/3/20	OPP-RM	-21.966245	120.104422	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.966505	120.103807	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.966974	120.10432	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.966982	120.104262	3
Acacia aphanoclada	8/3/20	OPP-MM	-21.967001	120.10431	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.967014	120.104019	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.967015	120.104048	1
Acacia aphanoclada	14/3/20	OPP-RM	-21.967025	120.104125	1
Acacia aphanoclada	8/3/20	OPP-MM	-21.967043	120.104154	2
Acacia aphanoclada	8/3/20	OPP-MM	-21.967128	120.103843	1

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	8/3/20	OPP-MM	-21.967154	120.103774	1
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968636	120.102303	1
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968769	120.102213	3
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968831	120.102144	1
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968915	120.102297	5
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968964	120.101967	13
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.968979	120.101812	5
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.969051	120.101791	2
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.969119	120.102573	7
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.969194	120.102746	6
Acacia aphanoclada	14/3/20	OPP-ALBrM	-21.969206	120.101923	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 14/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 10.0 km south of Walter Road in Nullagine, on the southeastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.969288 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.102976 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				3
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall sparse shrubland (Acacia inaequilatera)
2. Hummock grassland (Triodia wiseana, T. epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

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

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 10.5 km south of Walter Road in Nullagine, on the southeastern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.972618 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.09987 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall sparse shrubland (Acacia inaequilatera)
2. Hummock grassland (Triodia wiseana, T. epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

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

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☐

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 10.3 km south of Walter Road in Nullagine, on the northwestern side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.971216 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.097654 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				500
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Tall isolated shrubs to tall sparse shrubland (Acacia inaequilatera)
2. Hummcok grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
One additional record for this population is attached. Within 500 m of WAH vouchers (Sheet 167541, 379131)

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_28

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Acacia aphanoclada	8/3/20	OPP-MM	-21.971216	120.097654	500	Not a new pop; within 500 m of voucher Sheet 167541, 379131
Acacia aphanoclada	8/3/20	OPP-MM	-21.968364	120.101234	50	

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia aphanoclada **TPFL Pop. No:**

OBSERVATION DATE: 14/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 1.8 km northwest of Walter Road in Nullagine, on the southeast side of Marble Bar Road.

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.87906 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.121911 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				4
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Hummock grassland (Triodia brizoides)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Additional records for this population are attached.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF).

The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_ACAaph_TPRF_29

Species	Date	Biota Site	Latitude	Longitude	Abundance
Acacia aphanoclada	14/3/20	OPP-MM	-21.878671	120.122412	1
Acacia aphanoclada	14/3/20	OPP-JK	-21.878809	120.122013	1
Acacia aphanoclada	14/3/20	OPP-JK	-21.878963	120.122058	1
Acacia aphanoclada	14/3/20	OPP-JK	-21.87906	120.121911	4
Acacia aphanoclada	14/3/20	OPP-JK	-21.879086	120.121862	3
Acacia aphanoclada	14/3/20	OPP-JK	-21.87909	120.122055	1
Acacia aphanoclada	14/3/20	OPP-JK	-21.87909	120.122104	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Acacia cyperophylla var. omearana **TPFL Pop. No:**

OBSERVATION DATE: 14/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 1.2 km east-southeast of Walter Road in Nullagine, on the southern bank of the Nullagine River.

Reserve no:

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

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

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.886922

Long / Easting: 120.118793

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

Record entered by: **Sheet No.:** **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

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

VEGETATION CLASSIFICATION*:

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

1. Open forest (Eucalyptus camaldulensis, E. victrix)
2. Low open woodland (Atalaya hemiglauca, Acacia coriacea subsp. pendens)
3. Grassland (Cenchrus spp.)
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

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

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

COMMENT:

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
12m tree on bank of Nullagine River, pendulous branches, weeping foliage

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

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

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

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

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: [redacted] Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 9.9 km north of Walter Road in Nullagine, on the eastern side of Marble Bar Road

Reserve no:

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

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

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.804222 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.10748 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

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

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. 1 Size 80x10 Data attached ☒ Total area of quadrats (m^2): 800

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other: Loamy alluvial sand	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Low open woodland (Eucalyptus victrix)
2. Tall sparse shrubland (Acacia trachycarpa)
3. Sparese hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia coriacea subsp. pendens, Alternanthera nana, Hybanthus aurantiacus, Pluchea dentex, Waltheria indica.

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

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

COMMENT: Cattle and weeds present, flood damage.

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

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

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

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

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

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

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

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Eragrostis crateriformis* population described on the TPRF.

Biota TPRF reference: 1509_ERAcra_TPRF_01

Marble Bar Rd Upgrade **Site** MBU30

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 80 x 10 m

MGA Zone 51 200936 mE, 7586073 mN 120.107537°E, -21.803823°S

Habitat Creek bed; high flow area.

Soil Weak red (2.5YR 5/2) loamy alluvial sand.

Rock Type N/A.

Vegetation *Eucalyptus victrix* low open woodland over *Acacia trachycarpa* tall open shrubland over *Triodia longiceps* very open hummock grassland.

Veg Condition Poor: cattle and weeds present; flood damage.

Fire Age Very long unburnt.

Notes Quadrat established to fit irregular area of high flow creek bed. Only one plant of soft spinifex; consider excluding for floristic analysis.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	90	MBU30-42	
Acacia coriacea subsp. *pendens*	0.1	90		Juvenile.
Acacia trachycarpa	10	300		flood killed.
Aeschynomene indica	0.1	25	MBU30-06	
Alternanthera nana	0.1	20		
Amaranthus undulatus	0.1	40	MBU30-04, -35	
Arivela viscosa	0.1	40	MBU30-09. -33	
Bergia pedicellaris	0.1	5	MBU30-38	
**Bidens bipinnata*	0.1	25	MBU30-39	
Boerhavia burbidgeana	0.1	10	MBU30-31	
Boerhavia coccinea	0.1	12	MBU30-03	Sens lat.
Bulbostylis barbata	0.1	15	MBU30-48	
Calandrinia tepperiana	0.1	12	MBU30-55	PLDK: petals <7. Det confirmed by M Hislop (WAH).
Cassytha capillaris	0.1	40	MBU30-16	Creeper.
**Cenchrus ciliaris*	0.1	20		
**Cenchrus setiger*	0.1	60	MBU30-05	
Chloris pumilio	0.1	25	MBU30-41	
Chrysopogon fallax	0.1	70	MBU30-10	
Commelina ensifolia	0.1	30	MBU30-52	
Corchorus parviflorus	0.1	70	MBU30-13	
Corchorus tridens	0.1	6	MBU30-51	
Cucumis picrocarpus	0.1	40	MBU30-08	
Cucumis variabilis	0.1	50	MBU30-07	
Cullen leucanthum	0.1	20	MBU30-56	Juvenile.
Cyperus bulbosus	0.1	20	MBU30-47	Det by M Hislop (WAH).
Cyperus iria	0.1	40	MBU30-25	
Cyperus squarrosus	0.1	5	MBU30-37	
Dactyloctenium radulans	0.1	5		
**Echinochloa colona*	0.1	55	MBU30-26	
**Eragrostis cilianensis*	0.1	25	MBU30-21	
Eragrostis crateriformis	0.1	40	MBU30-28	
Eragrostis cumingii	0.1	15	MBU30-22	
Eragrostis leptocarpa	0.1	20	MBU30-23	
Eucalyptus victrix	10	10		
Eulalia aurea	0.1	15	MBU30-11	PLDK: sens. lat.

Species	Cover	Height	Specimen	Notes
Euphorbia australis var. *subtomentosa*	0.1	1	MBU30-50	Prostrate.
Euphorbia trigonosperma	0.1	30	MBU30-17	Erect herb.
Evolvulus alsinoides var. *decumbens*	0.1	30	MBU30-20	
Fimbristylis depauperata	0.1	35	MBU30-24	
Fimbristylis microcarya	0.1	30	MBU30-27	
Gomphrena cunninghamii	0.1	20	MBU30-49	
Goodenia lamprosperma	0.1	25		
Gossypium australe	0.1	15		Juvenile. Burrup Peninsula form: greener indumentum.
Hybanthus aurantiacus	0.1	25	MBU30-15	PLDK: sens. lat.
Indigofera hirsuta	0.1	10	MBU30-45A	Juvenile. MET det.
Indigofera linifolia	0.1	10		
Indigofera linnaei	0.1	30	MBU30-30	
Indigofera monophylla	0.1	100	MBU30-12	
Ipomoea muelleri	0.1	20	Flowers mauve. Creeper.	
Ipomoea polymorpha	0.1	10	MBU30-19	Annual.
Ipomoea racemigera	0.1	50	MBU30-02	Flowers white.
Ludwigia perennis	0.1	50	MBU30-54	
Paspalidium rarum	0.1	12	MBU30-36	
Perotis rara	0.1	10		
Phyllanthus maderaspatensis	0.1	30		
Pluchea dentex	0.1	15	MBU30-32	
Pluchea rubelliflora	0.1	15	MBU30-29	
Polymeria ambigua	0.1	10	MBU30-40, -44	
Portulaca oleracea/intraterranea	0.1	5	MBU30-18	PLDK: seeds faintly nippled.
Sida fibulifera	0.1	15	MBU30-45	Spreading to 45cm. PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	20	MBU30-46	
Solanum diversiflorum	0.1	20		
Sorghum plumosum var. *plumosum*	0.1	118	MBU30-43	
Stemodia grossa	0.1	7		
Trianthema triquetrum	0.1	8	MBU30-34	
Triodia epactia	0.1	50	MBU30-53	PLDK: sens. lat.
Triodia longiceps	10	60	MBU30-01	Blue green leaves.
Vigna lanceolata var. *lanceolata*	0.1	40	MBU30-14	Creeper.
Waltheria indica	0.1	40		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 10/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

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

Approximately 10.6 km south of Walter Road in Nullagine, on the northwestern side of Marble Bar Road

Reserve no:

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

DATUM:

GDA94 / MGA94 ☒

AGD84 / AMG84 ☐

WGS84 ☐

Unknown ☐

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

DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.974136

Long / Easting: 120.096868

ZONE:

METHOD USED:

GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

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

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

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

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

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

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

COMMENT:

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

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

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

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

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Fluvial		Loamy alluvial sand	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

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

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

1. Woodland (Eucalyptus victrix)
2. Low isolated trees (Atalaya hemiglauca, Acacia coriacea subsp. pendens)
3. Grassland (*Cenchrus ciliaris, *C. setiger)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia pyrifolia var. pyrifolia, Corchorus parviflora, Cymbopogon ambiguus, Indigofera colutea, Triodia longiceps.

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

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

COMMENT: Dense cover of *Cenchrus spp., cattle grazing.

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

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

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

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

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

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

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 6.9 km north northeast of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.830871 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.123109 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 60x40 Data attached ☒ Total area of quadrats (m^2): 2400

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☒	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Calcrete				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low isolated shrubs (Acacia trachycarpa)
2. Sparse hummock grassland (Triodia longiceps)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia inaequilatera, Corchorus parviflorus, Phyllanthus maderaspatensis, Triodia epactia

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Cattle scats and tracks, *Cenchrus ciliaris

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Eragrostis crateriformis* population described on the TPRF.

Biota TPRF reference: 1509_ERAcra_TPRF_03

Marble Bar Rd Upgrade **Site** MBU32

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 202573 mE, 7583137 mN 120.122824°E, -21.830592°S

Habitat Low-lying area between ridges; possible flow area.

Soil Light reddish brown (2.5YR 6/4) sandy loam.

Rock Type N/A; mapped as Calcrete.

Vegetation Acacia trachycarpa scattered low shrubs over Triodia longiceps very open hummock grassland.

Veg Condition Very Good: cattle tracks, scats; *Cenchrus.

Fire Age Burnt 2-3 years ago.

Notes Naturally open site. Less than 1% combined of 2 taller Sida spp., but probably short-lived and responding to rainfall.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	0.1	230	MBU32-05	
Acacia synchronicia	0.1	60	MBU32-13	PLDK: sens. lat.
Acacia trachycarpa	0.1	100		Most killed by fire.
Arivela viscosa	0.1	5		
Boerhavia burbidgeana	0.1	10	MBU32-15	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	10	MBU32-22	Sens lat.
Bulbostylis barbata	0.1	10	MBU32-21	
Calandrinia stagnensis	0.1	4	MBU32-19	
**Cenchrus ciliaris*	0.1	25		
Corchorus parviflorus	0.1	60	MBU32-02	
Dactyloctenium radulans	0.1	10		
Eragrostis crateriformis	0.1	30	MBU32-23	PLDK: matches MBU54-46.
Eragrostis cumingii	0.1	10		
Eragrostis dielsii	0.1	20	MBU32-25	Uncommon locally. Det confirmed by M Hislop (WAH).
Euphorbia trigonosperma	0.1	8	MBU32-09	
Evolvulus alsinoides var. *decumbens*	0.1	20	MBU32-32	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU32-17	
Fimbristylis dichotoma	0.1	20	MBU32-04	PLDK: sens. lat.; styles wholly ciliate.
Gomphrena cunninghamii	0.1	4	MBU32-28	
Goodenia microptera	0.1	3	MBU32-20	
Heliotropium cunninghamii	0.1	15	MBU32-27	
Hibiscus sturtii var. *grandiflorus*	0.1	30	MBU32-24	
Indigofera colutea	0.1	5	MBU32-08	
Paraneurachne muelleri	0.1	40		
Paspalidium rarum	0.1	10	MBU32-14	
Perotis rara	0.1	6		
Phyllanthus maderaspatensis	0.1	1		
Pluchea ferdinandi-muelleri	0.1	40		
Pluchea tetranthera	0.1	50		
Polymeria ambigua	0.1	25	MBU32-06, -29	
Portulaca oleracea/intraterranea	0.1	4	MBU32-07	PLDK: seeds nippled.
Ptilotus exaltatus	0.1	4		
Sclerolaena costata	0.1	15	MBU32-30	

Species	Cover	Height	Specimen	Notes
Senna artemisioides subsp. *helmsii*	0.1	5		
Sida arsiniata	0.1	35	MBU32-18	
Sida clementii	0.1	40	MBU32-12	
Sida fibulifera	0.1	20	MBU32-03	PLDK: sens. lat.
Sida sp. L (A.M. Ashby 4202)	0.1	20	MBU32-16	
Sporobolus actinocladus	0.1	40	MBU32-31	
Sporobolus australasicus	0.1	15		
Streptoglossa decurrens	0.1	5	MBU32-10	
Trianthema triquetrum	0.1	10	MBU32-11	
Tribulus hirsutus	0.1	10	MBU32-26	
Trigastrotheca molluginea	0.1	20		
Triodia epactia	0.1	45	MBU32-33	PLDK: sens. lat.
Triodia longiceps	9	50	MBU32-01	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Rachel Warner **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 27.4 km southwest of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.087718 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.994772 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Mudstone		Alluvial sand	Yellowish red	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix)
2. Low woodland (Acacia coriacea subsp. pendens, Atalaya hemiglauca)
3. Tall open shrubland (Melaleuca glomerata)
4. Open grassland (*Cenchrus setiger, *Echinochloa colona)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia ampliceps, Alysicarpus muelleri, Cyperus vaginatus, Eulalia aurea, Triodia longiceps.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☒ Good ☒ Degraded ☐ Completely degraded ☐

COMMENT: Very Good to Good: moderate *Cenchrus cover and other weeds, cattle.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Eragrostis crateriformis* population described on the TPRF.

Biota TPRF reference: 1509_ERAcra_TPRF_04

Marble Bar Rd Upgrade **Site** MBU51

Described by RW,AL **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 809040 mE, 7554459 mN 119.994822°E, -22.087334°S

Habitat Major creek bed with islands.

Soil Yellowish red alluvial sand.

Rock Type Mudstone.

Vegetation *Eucalyptus victrix* woodland over *Acacia coriacea* subsp. *pendens,* (*Atalaya hemiglauca*) low woodland over *Melaleuca glomerata* tall shrubland over **Cenchrus setiger* , (**Echinochloa colona*) open tussock grassland.

Veg Condition Good to Poor: moderate **Cenchrus* cover and other weeds present; light grazing by cattle.

Fire Age No sign of recent fire.

Notes Small pools of water in creek bed.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	130		
Acacia coriacea subsp. *pendens*	15	600		
Alternanthera denticulata	0.1	25	MBU51-10	
Alysicarpus muelleri	0.1	20	MBU51-46	
Amaranthus undulatus	0.1	90	MBU51-33	
Ammannia multiflora	0.1	25	MBU51-38, -47	Herb, in wet area.
Arivela viscosa	0.1	40		
Atalaya hemiglauca	2	130		
Boerhavia coccinea	0.1	20	MBU51-41	Sens lat.
Bulbostylis barbata	0.1	5	MBU51-06	
Calandrinia tepperiana	1	20	MBU51-08	Pink and white flowers. PLDK: petals <7; matches MBU30-55.
**Cenchrus ciliaris*	0.1	45		NI=10
**Cenchrus setiger*	20	120		NI=1000
Centipeda minima subsp. *macrocephala*	0.1	5	MBU51-32	
Chara sp.	0.1	20	MBU51-49	Aquatic algae. In water pool.
**Citrullus colocynthis*	0.1	45	MBU51-43	NI=5.
Corchorus parviflorus	0.1	35	MBU51-11	
Corchorus tridens	0.1	20	MBU51-20	
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	35		
Cyperus difformis	0.1	40	MBU51-15	
Cyperus iria	0.1	25	MBU51-05	
Cyperus ixiocarpus	0.1	40	MBU51-37	
Cyperus squarrosus	0.1	20	MBU51-01	
Cyperus vaginatus	0.1	35		
Dactyloctenium radulans	0.1	2		
**Echinochloa colona*	1	25	MBU51-25	
Eragrostis crateriformis	0.1	35	MBU51-04	PLDK: matches MBU54-46.
Eragrostis cumingii	0.1	35	MBU51-03	
Eucalyptus victrix	20	1400	MBU51-14	
Eulalia aurea	0.1	80	MBU51-27	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	2	MBU51-31	

Species	Cover	Height	Specimen	Notes
**Euphorbia hirta*	0.1	20	MBU51-30	
Euphorbia trigonosperma	0.1	30	MBU51-22	
Fimbristylis depauperata	0.1	20	MBU51-07	
Goodenia lamprosperma	0.1	35	MBU51-29	
Hybanthus aurantiacus	0.1	20	MBU51-36	PLDK: sens. lat.
Ipomoea muelleri	0.1	25	MBU51-26	
Ipomoea polymorpha	0.1	20	MBU51-45	
Ipomoea racemigera	0.1	35	MBU51-42	
Lipocarpha microcephala	0.1	25	MBU51-28	
Ludwigia perennis	0.1	25	MBU51-39	Herb.
**Malvastrum americanum*	0.1	40		NI=2
Marsilea hirsuta	0.1	2	MBU51-48	
Melaleuca glomerata	12	250	MBU51-34	White paperbark strips.
Melaleuca linophylla	0.1	140	MBU51-35	Papery bark, creamy brown.
Notoleptopus decaisnei	0.1	10	MBU51-09	
Phyllanthus maderaspatensis	0.1	25		
**Physalis angulata*	0.1	30	MBU51-17	
Pluchea dentex	0.1	5	MBU51-18	
Pluchea rubelliflora	0.1	10	MBU51-23	
Plumbago zeylanica	0.1	25	MBU51-19	NI=1.
Portulaca intraterranea	0.1	20	MBU51-16	Det confirmed by M Hislop (WAH): all identifications in the *P. oleracea* complex are tentative pending much-needed revision of this difficult group.
Pterocaulon sphacelatum	0.1	2	MBU51-40	Juvenile.
Rostellularia adscendens var. *clementii*	0.1	25	MBU51-13	
Sesbania cannabina	0.1	30		
Solanum horridum	0.1	3	MBU51-50	
Sporobolus australasicus	0.1	20	MBU51-02	
Stemodia grossa	0.1	15	MBU51-21	
Triodia longiceps	0.1	30	MBU51-12	
**Vachellia farnesiana*	0.1	110		NI=1
Vigna lanceolata var. *lanceolata*	0.1	30	MBU51-24	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	35	MBU51-44	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 10/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 13.3 km south-southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.994327 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.082123 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Floodplain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:

Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix, Acacia coriacea subsp. pendens)
2. Grassland (*Cenchrus ciliaris, *C. setiger)
3. Isoloated sedges (Cyperus vaginatus)
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☐ Degraded ☒ Completely degraded ☐

COMMENT: Weeds, grazing

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. Scattered in degraded floodplain.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Eragrostis crateriformis **TPFL Pop. No:**

OBSERVATION DATE: 11/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 38.4 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.168503 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.943893 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Riverstone		Alluvial clayey sand	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Open woodland (Eucalyptus victrix)
2. Isolated low trees (Acacia coriacea subsp. pendens)
3. Isolated tall shrubs (Melaleuca bracteata)
4. Grassland (*Cenchrus ciliaris, *C. setiger)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia bivenosa, A. trcahycarpa, Cymbopogon ambiguus, Gossypium australe, Rhynchosia minima.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☐ Degraded ☒ Completely degraded ☐

COMMENT: Cattle scats and tracks, high *Cenchrus cover

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. ID determined by M. Hislop (WAH).

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Eragrostis crateriformis* population described on the TPRF.

Biota TPRF reference: 1509_ERAcra_TPRF_06

Marble Bar Rd Upgrade **Site** MBU54

Described by RM,MET **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803593 mE, 7545609 mN 119.943749°E, -22.168141°S

Habitat Creek bed, banks and islands; flowing E-W.

Soil Reddish brown alluvial clayey sand.

Rock Type Riverstone.

Vegetation *Eucalyptus victrix* open woodland over *Acacia coriacea* subsp. *pendens* scattered low trees over *Melaleuca bracteata* scattered tall shrubs over **Cenchrus ciliaris, *C. setiger* tussock grassland with *Cyperus vaginatus* scattered sedges.

Veg Condition Very Poor: Cattle tracks and scats; high cover of **Cenchrus* spp.

Fire Age No sign of recent fire.

Notes Native plants on banks below **Cenchrus*.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	60		Juvenile. grazed.
Acacia bivenosa	0.1	200	MBU54-43	PLDK: sens. lat.
Acacia coriacea subsp. *pendens*	2	700		
Acacia trachycarpa	0.1	40		
Achyranthes aspera	0.1	60	MBU54-36	
**Aerva javanica*	0.1	70		
Alternanthera angustifolia	0.1	25	MBU54-38	Det by M Hislop (WAH).
Alternanthera nana	0.1	10		
Alysicarpus muelleri	0.1	15	MBU54-32	
Amaranthus undulatus	0.1	45	MBU54-05	
Ammannia baccifera	0.1	15	MBU54-18B	
Ammannia multiflora	0.1	15	MBU54-18A	
Arivela viscosa	0.1	50	MBU54-02	
Atalaya hemiglauca	0.1	450		
Bergia trimera	0.1	10	MBU54-22	
Boerhavia burbidgeana	0.1	10	MBU54-26	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	0.1	10	MBU54-03	Sens lat.
Bulbostylis barbata	0.1	10	MBU54-16	
Bulbostylis turbinata	0.1	10	MBU54-23	
**Cenchrus ciliaris*	35	80		
**Cenchrus setiger*	35	80		
Centipeda minima subsp. *macrocephala*	0.1	10	MBU54-37	
**Citrullus colocynthis*	0.1	40	MBU54-45	
Corchorus parviflorus	0.1	70	MBU54-40	
Corchorus tridens	0.1	10	MBU54-25	
Cucumis variabilis	0.1	40	MBU54-10	Creeper.
Cymbopogon ambiguus	0.1	90	MBU54-39	Leaves blueish.
**Cynodon dactylon*	0.1	10	MBU54-12	Prostrate.
Cyperus squarrosus	0.1	30	MBU54-19	
Cyperus vaginatus	1	60		
Dactyloctenium radulans	0.1	15		
Dysphania rhadinostachya	0.1	20		Sterile.
**Echinochloa colona*	0.1	70	MBU54-15	
Enneapogon polyphyllus	0.1	40		

Species	Cover	Height	Specimen	Notes
Eragrostis crateriformis	0.1	20	MBU54-46	Det confirmed by M Hislop (WAH).
Eragrostis cumingii	0.1	12		
Eucalyptus victrix	4.5	1400		
Euphorbia australis var. *subtomentosa*	0.1	5	MBU54-11	Prostrate.
**Euphorbia hirta*	0.1	10	MBU54-21A	
Euphorbia trigonosperma	0.1	45	MBU54-01	
Evolvulus alsinoides var. *villosicalyx*	0.1	20	MBU54-28	
Fimbristylis elegans	0.1	20	MBU54-21	PLDK: leaves long. Det confirmed by M Hislop (WAH).
Glycine canescens	0.1	30	MBU54-09	
Gossypium australe	0.1	60		Burrup Peninsula form: greener indumentum.
Indigofera colutea	0.1	10		
**Indigofera hochstetteri*	0.1	15	MBU54-35	Pea. Curved pod.
Indigofera linifolia	0.1	35	MBU54-09A	
Indigofera linnaei	0.1	25	MBU54-27	
Indigofera trita subsp. *trita*	0.1	40	MBU54-33	
Ipomoea muelleri	0.1	15		
Ipomoea plebeia	0.1	70	MBU54-13	White flowers.
Ipomoea polymorpha	0.1	13	MBU54-34	
**Malvastrum americanum*	0.1	35		
Melaleuca bracteata	0.8	450	MBU54-07	
Melaleuca glomerata	0.1	600		
Perotis rara	0.1	10		
Phyllanthus erwinii	0.1	10	MBU54-29	
Pluchea rubelliflora	0.1	12	MBU54-17	
Portulaca oleracea/intraterranea	0.1	12	MBU54-20	PLDK: seeds faintly nippled.
Rhynchosia minima	0.1	25	MBU54-44	
Scaevola amblyanthera var. *centralis*	0.1	15	MBU54-04	PLDK: sens. lat.
Sida sp.	0.1	6	MBU54-30	Juvenile.
Sporobolus australasicus	0.1	35	MBU54-24	
Stemodia grossa	0.1	7		
**Trianthema portulacastrum*	0.1	15	MBU54-31	
Trianthema triquetrum	0.1	15	MBU54-14	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	30	MBU54-41	PLDK: larger flowers and long pedicel. Det by M Hislop: Difficult to place; either a variant of this taxon or a hybrid/intergrade with *T. terrestris*.
**Tribulus terrestris*	0.1	10	MBU54-42	Small flowers. Sens. lat.
Triodia longiceps	0.1	80	MBU54-08	
**Vachellia farnesiana*	0.1	250	NI=40	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Euphorbia inappendiculata var. inappendiculata **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 19.9 km southwest of Walter Road in Nullagine, on the northwestern side of Marble Bar Road

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM:

GDA94 / MGA94 ☒

AGD84 / AMG84 ☐

WGS84 ☐

Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)

DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.039858

Long / Easting: 120.039124

ZONE:

METHOD USED:

GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☒	Grey ☐	inundated ☐
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Kylena formation; basalt				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse forbland (Sida fibulifera, Neptunia diamorphantha, Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)
2. Open annual grassland (Cynodon convergens)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Desmodium campylocaulon, Goodenia muelleriana, Ptilotus gomphrenoides.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus setiger, old cattle tracks

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Euphorbia inappendiculata* var. *inappendiculata* population described on the TPRF.

Biota TPRF reference: 1509_EUPini_TPRF_01

Marble Bar Rd Upgrade **Site** MBU55

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 194364 mE, 7559832 mN 120.039142°E, -22.039458°S

Habitat Area of cracking clay on crest of low basalt rise; gentle slope to SW.

Soil Red (2.5YR4/6) light clay; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Sida fibulifera, Neptunia dimorphantha, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273) very open herbland with *Cynodon convergens* open annual grassland.

Veg Condition Very Good: a few plants of **Cenchrus setiger*; old cattle scats; a few bits of rubbish.

Fire Age No sign of recent fire.

Notes Conditions are very dry; lots of annuals still present but likely to be missing very delicate/short-lived spp.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	10	MBU55-35	
Alysicarpus muelleri	0.1	15	MBU55-27	PLDK: unusual form; decumbent.
Aristida contorta	0.1	15	MBU55-33A	
Aristida latifolia	0.1	15	MBU55-21	
Arivela viscosa	0.1	35	MBU55-03	
Boerhavia paludosa	0.1	12	MBU55-07	
**Cenchrus setiger*	0.1	15		
Chloris pectinata	0.1	12	MBU55-18	
Corchorus tridens	0.1	3	MBU55-19	
Crotalaria medicaginea var. *neglecta*	0.1	15	MBU55-11	
Cucumis picrocarpus	0.1	10	MBU55-25	
Cynodon convergens	20	7		
Dactyloctenium radulans	0.1	7		
Desmodium campylocaulon	0.1	20	MBU55-16A	
Desmodium muelleri	0.1	20	MBU55-09, -23	
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU55-13	
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MBU55-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU55-30	
Gomphrena cunninghamii	0.1	7		
Goodenia muelleriana	0.1	7	MBU55-17	
Heliotropium conocarpum	0.1	10	MBU55-10	
Heliotropium tanythrix	0.1	15	MBU55-32	Det confirmed by M Hislop (WAH).
Hibiscus brachysiphonius	0.1	10	MBU55-24A	Flowers mauve.
Indigofera colutea	0.1	5		
Indigofera linifolia	0.1	15		
Indigofera trita subsp. *trita*	0.1	12	MBU55-22A	
Iseilema vaginiflorum	0.1	5	MBU55-20	
Neptunia dimorphantha	1	6	MBU55-05	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	10	MBU55-12A	
Paspalidium retiglume	0.1	15	MBU55-16	
Phyllanthus maderaspatensis	0.1	15	MBU55-29	

Species	Cover	Height	Specimen	Notes
Portulaca intraterranea	0.1	7	MBU55-02	PLDK: matches MBU51-16.
Portulaca oleracea/intraterranea	0.1	5	MBU55-01	
Ptilotus aervoides	0.1	3	MBU55-28	
Ptilotus gomphrenoides	0.1	10	MBU55-34	PLDK: sens. lat.
Rhynchosia minima	0.1	5	MBU55-09A	
Rostellularia adscendens var. *clementii*	0.1	7	MBU55-26	
Sclerolaena costata	0.1	12	MBU55-31	
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.1	20	MBU55-33	MET det.
Sida fibulifera	1	10	MBU55-04	PLDK: sens. lat.
Sporobolus australasicus	0.1	8		
Streptoglossa liatroides	0.1	6	MBU55-08	
Swainsona thompsoniana	0.1	10	MBU55-12	MET det.
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.5	5	MBU55-06	
Trianthema triquetrum	0.1	5	MBU55-22B	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	5	MBU55-15	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Euphorbia inappendiculata var. inappendiculata **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 22.0 km southwest of Walter Road in Nullagine, on the southeastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.053875 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.025171 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Kylena formation; basalt		Cracking clay loam	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse shrubland (Acacia synchronicia)
2. Low isolated shrubs (Senna hamersleyensis x S. sp. Karijini (M.E. Trudgen 10392)
3. Open hummock grassland (Triodia longiceps, T. epactia)
4. Open forbland (Neptunia diamorphantha)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Cullen graveolens, Eragrostis leptocarpa, Ipomoea muelleri, Sclerolaena costata.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus spp. And *Aerva, cattle scats.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. ID determined by M. Hislop (WAH).

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: Chloe Flaherty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Euphorbia inappendiculata* var. *inappendiculata* population described on the TPRF.

Biota TPRF reference: 1509_EUPini_TPRF_02

Marble Bar Rd Upgrade **Site** MBU46

Described by RM,SC **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 192950 mE, 7558250 mN 120.025160°E, -22.053483°S

Habitat Plain; mosaic of stony soil and patches of cracking clay.

Soil Reddish brown clay loam; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Acacia synchronicia* open shrubland over *Senna hamersleyensis* x *S.* sp. Karijini (M.E. Trudgen 10392) scattered low shrubs over *Triodia longiceps, T. epactia* open hummock grassland over *Neptunia dimorphantha* open herbland with *Sporobolus australasicus* very open annual grassland.

Veg Condition Very Good: small amount of **Cenchrus* spp. and **Aerva*; cattle scats.

Fire Age Burnt 3-5 years ago.

Notes Typical clay spp. present.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	15	MBU46-19	
Acacia synchronicia	3	150		
**Aerva javanica*	0.1	30		NI=1.
Alysicarpus muelleri	0.1	20	MBU15-01=	
Aristida latifolia	0.1	30	MBU46-28	
Arivela viscosa	0.1	20		
Boerhavia coccinea	0.1	15	MBU45-03=	Sens lat.
Bulbostylis turbinata	0.1	5	MBU46-27	
**Cenchrus ciliaris*	0.1	30		NI=100
**Cenchrus setiger*	0.1	30		
Chloris pectinata	0.1	10	MBU46-06	
Corchorus tridens	0.1	5	REL12-15=	
Crotalaria medicaginea var. *neglecta*	0.1	10		
Cullen graveolens	0.1	10	MBU46-14	On clay.
Cynodon convergens	0.1	5	MBU46-07	PLDK: spike length intermediate between taxa. Det confirmed by M Hislop (WAH).
Dactyloctenium radulans	0.1	5		
Desmodium campylocaulon	0.1	10	MBU46-20	
Desmodium muelleri	0.1	20	MBU46-21	
Dichanthium sericeum subsp. *humilius*	0.1	20		
Enneapogon caerulescens	0.1	20	MBU46-29	
Eragrostis leptocarpa	0.1	60	MBU46-10	
Eragrostis tenellula	0.1	10	MBU46-11	
Eriachne mucronata (typical form)	0.1	20	MBU46-24	
Eriachne pulchella	0.1	5		
Euphorbia inappendiculata var. *inappendiculata*	0.1	5	MBU46-12	Det confirmed by M Hislop (WAH).
Euphorbia trigonosperma	0.1	15	MBU46-23	
Evolvulus alsinoides var. *villosicalyx*	0.1	5		
Goodenia muelleriana	0.1	20	MBU46-22	Sens. lat.
Hibiscus brachysiphonius	0.1	10	SC27=	Prostrate.
Ipomoea muelleri	0.1	20	REL08-04=	
Neptunia dimorphantha	25	5	MBU46-01	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU46-13	

Species	Cover	Height	Specimen	Notes
Phyllanthus maderaspatensis	0.1	10	MBU46-17	
Portulaca oleracea/intraterranea	0.1	5		
Ptilotus gomphrenoides	0.1	10	MBU46-18	PLDK: sens. lat.
Rhynchosia minima	0.1	5		
Rostellularia adscendens var. *clementii*	0.1	5	MBU46-15	
Sclerolaena cornishiana	0.1	25	MBU46-25	
Sclerolaena costata	0.1	10	MBU46-26	
Senna glutinosa subsp. *x luerssenii*	0.1	30		
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.5	10	MBU46-03	MET det.
Sida fibulifera	0.1	10	MBU46-08	PLDK: sens. lat.
Sporobolus australasicus	9	5		
Streptoglossa liatroides	0.1	10	MBU46-09	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	5	MBU46-30	On clay.
Trianthema triquetrum	0.1	10		
Tribulus hirsutus	0.1	10		
Triodia epactia	10	40	MBU46-16	
Triodia longiceps	10	60		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Goodenia nuda **TPFL Pop. No:**

OBSERVATION DATE: 11/3/2020 **CONSERVATION STATUS:** P4 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 35.8 km southwest of Walter Road in Nullagine, on the northwestern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.148665 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.95437 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: **Sheet No.:** **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:
Crest ☐
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☒
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other:

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☐
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☐
Sandy loam ☐
Loam ☒
Clay loam ☐
Light clay ☐
Peat ☐
Specify other:

SOIL COLOUR:
Red ☒
Brown ☒
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other:
Reddish brown

DRAINAGE:
Well drained ☐
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element
(Refer to field manual for additional values)
Floodplain

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low open woodland (Corymbia hamersleyana)
2. Tall sparse shrubland (*Vachellia farnesiana, Acacia trachycarpa)
3. Open grassland (*Cenchrus ciliaris, *C. setiger)
4. Sparse forbland (Boerhavia coccinea, Indigofera linnaei, Boerhavia burbidgeana)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia pyrifolia var. pyrifolia, Atalaya hemiglauca, Corchorus parviflorus, Cucumis melo, Hakea lorea subsp. lorea, Triodia epactia, T. longiceps.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☒ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: *Cenchrus and other weeds; recent cattle activity (scats, tracks and grazing).

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Goodenia nuda* population described on the TPRF.

Biota TPRF reference: 1509_GOOnud_TPRF_01

Marble Bar Rd Upgrade **Site** MBU47

Described by AL,BRM **Date** 11-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 804732 mE, 7547791 mN 119.954371°E, -22.148254°S

Habitat Floodplain adjacent to creek.

Soil Reddish brown (2.5YR 4/4) loam.

Rock Type N/A.

Vegetation *Corymbia hamersleyana* low open woodland over **Vachellia farnesiana, Acacia trachycarpa* tall open shrubland over **Cenchrus ciliaris, (*C. setiger*) open tussock grassland over *Boerhavia coccinea, Indigofera linnaei, Boerhavia burbidgeana* very open herbland.

Veg Condition Good: small amount of **Cenchrus* cover and other weeds present; signs of recent cattle activity (scat, tracks, grazing).

Fire Age Burnt 3-5 years ago.

Species	Cover	Height	Specimen	Notes
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	0.1	15	MBU47-45	PLDK: atypical. Det by M Hislop (WAH).
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	110	MBU47-09	PLDK: sens. lat.
Acacia pyrifolia var. *pyrifolia*	0.1	180		
Acacia tetragonophylla	0.1	210		
Acacia trachycarpa	1	400		
**Aerva javanica*	0.1	45		NI=4
Alternanthera nana	0.1	15		
Alysicarpus muelleri	0.1	55	MBU47-34	
Amaranthus undulatus	0.1	40	MBU17-05=	
Arivela viscosa	0.1	40		
Atalaya hemiglauca	0.1	160		
Boerhavia burbidgeana	2	20	MBU47-21	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia coccinea	5	15	MBU47-20	Sens. lat.
Boerhavia coccinea	0.1	10	MBU47-48	Compound fruits. Sens lat.
**Cenchrus ciliaris*	25	45		
**Cenchrus ciliaris*	0.1	20	MBU47-43	Longer bristled form.
**Cenchrus setiger*	4	40		
Chrysopogon fallax	0.1	90		
**Citrullus colocynthis*	0.1	20	MBU47-51	Tennis-ball sized fruit.
Corchorus parviflorus	0.1	40	MBU47-24	
Corchorus tridens	0.1	30	MBU47-02	
Corymbia hamersleyana	7	550	MBU47-01	Sens. lat.
Crotalaria medicaginea var. *neglecta*	0.1	35		
Cucumis melo	0.1	10		
Cucumis variabilis	0.1	20		
Cullen leucanthum	0.1	70	MBU47-11	
Cynodon convergens	0.1	20	MBU47-42	
Cyperus vaginatus	0.5	40		
Dactyloctenium radulans	0.1	10		
Duperreya commixta	0.1	60		
Dysphania rhadinostachya	0.1	25		
Enneapogon caerulescens	0.1	20	MBU47-18	
Enneapogon polyphyllus	0.1	20	MBU47-16	PLDK: sens. lat.

Species	Cover	Height	Specimen	Notes
**Eragrostis cilianensis*	0.1	20	MBU47-04, 47	Det confirmed by M Hislop (WAH).
Eremophila longifolia	0.1	100	MBU47-23	
Euphorbia australis var. *subtomentosa*	0.1	10	MBU47-52	
Euphorbia biconvexa	0.1	15	MBU47-03	
Evolvulus alsinoides var. *decumbens*	0.1	35	MBU47-17	
Evolvulus alsinoides var. *villosicalyx*	0.1	15	Sterile.	
Glycine canescens	0.1	60	MBU47-37	
Goodenia forrestii	0.5	20	MBU47-27	Sens. lat.
Goodenia microptera	0.1	25	MBU47-25	
Goodenia nuda	0.1	40	MBU47-07	
Hakea lorea subsp. *lorea*	0.1	350		
Hibiscus coatesii	0.1	40	MBU47-14	Pale mauve flowers.
Hibiscus sturtii var. *platychlamys*	0.1	40	MBU47-29	
Hybanthus aurantiacus	0.1	30		
Indigofera colutea	0.1	15		
Indigofera linifolia	0.1	20	MBU47-35, 53	
Indigofera linnaei	3	20	MBU47-36	
Indigofera trita subsp. *trita*	0.1	25	MBU47-38	
Ipomoea polymorpha	0.1	20	MBU47-46	
**Malvastrum americanum*	0.1	40		
Notoleptopus decaisnei	0.1	25	MBU47-41	
Perotis rara	0.1	15		
Polygala glaucifolia	0.1	5	MBU47-44	Purple flowers.
Portulaca oleracea/intraterranea	0.1	10		
Ptilotus auriculifolius	0.1	30		
Rhynchosia minima	0.1	15	MBU47-26	
Scaevola amblyanthera var. *centralis*	0.1	15	MBU47-05	PLDK: sens. lat.
Senna notabilis	0.1	40		
Sesbania cannabina	0.1	10		
Sida echinocarpa	0.1	40	MBU47-30, 31	
Sida fibulifera	0.1	25	MBU47-39	PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	30	MBU47-32	
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	0.1	25	MBU47-13	Ferruginous form.
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	0.1	50	MBU47-33	
Solanum diversiflorum	0.1	20		
Solanum horridum	0.1	15	MBU47-22	
Solanum phlomoides	0.1	40	MBU47-10	
Sporobolus australasicus	0.1	20	MBU47-19	
Swainsona stenodonta	0.1	20	MBU47-54	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	40	MBU47-08, 50	PLDK: atypical indumentum R. Butcher.
Themeda triandra	0.1	70		
Trianthema triquetrum	0.1	10	MBU47-49	
Tribulus hirsutus	0.1	15		
Tribulus platypterus	0.1	50	MBU47-12	
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	15	MBU47-40	PLDK: matches MBU54-41; larger flowers and long pedicel.
Triodia epactia	0.1	40		Resinous, sterile.

Species	Cover	Height	Specimen	Notes
Triodia longiceps	0.1	25	MBU47-28	
**Vachellia farnesiana*	1.5	300		
Zaleya galericulata subsp. *galericulata*	0.1	15	MBU47-15	Prostrate herb, white flowers.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Goodenia nuda **TPFL Pop. No:**

OBSERVATION DATE: 4/3/2020 **CONSERVATION STATUS:** P4 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 3.0 km south-southeast of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM:
GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)
DecDegrees ☒ DegMinSec ☐ UTMs ☐
Lat / Northing: -21.911356
Long / Easting: 120.113166
ZONE:

METHOD USED:
GPS ☒ Differential GPS ☐ Map ☐
No. satellites: Map used:
Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☐
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☒	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole to	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐
Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Mosquito Creek formation; siltstone, chert, quartz		Fine sandy loam	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia bivenosa)
2. Hummcok grassland (Triodia longiceps)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Atriplex codonocarpa, Grevillea wickhamii subsp. hispidula, Pluchea rubeliflora, Sclerolaena densiflora, Senna symonii

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. Det confirmed by M Hislop (WAH).

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Goodenia nuda* population described on the TPRF.

Biota TPRF reference: 1509_GOOnud_TPRF_02

Marble Bar Rd Upgrade **Site** MBU31

Described by MM,RM,AL **Date** 04-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 201709 mE, 7574192 mN 120.112850°E, -21.911158°S

Habitat Gravelly plain / very gradual footslope off low ?basalt range of hills to E; gentle slope to W.

Soil Reddish brown (2.5YR 4/4) fine sandy loam.

Rock Type Mosquito Creek Formation; siltstone, chert, quartz; large patches of gravel and pebbles.

Vegetation *Acacia bivenosa* scattered tall shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Excellent: old cattle scat; old drink can.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	1.5	230		
Atriplex codonocarpa	0.1	20	MBU31-10	
Corchorus parviflorus	0.1	60	MBU31-09	
Cynodon prostratus	0.1	6	MBU31-11	
Duperreya commixta	0.1	150		
Goodenia nuda	0.1	40	MBU31-07	Det confirmed by M Hislop (WAH).
Grevillea wickhamii subsp. *hispidula*	0.1	180		Sterile; subsp. applied from flowering collections.
Maireana ? eriosphaera	0.1	30	MBU31-12	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Maireana melanocoma	0.1	55	MBU31-03	
Pluchea rubelliflora	0.1	35	MBU31-04	
Pterocaulon serrulatum var. *velutinum*	0.1	25	MBU31-05	MET det.
Pterocaulon sphacelatum	0.1	25	MBU31-08	
Sclerolaena densiflora	0.1	40	MBU31-02	PLDK: sens. lat.
Sclerolaena lanicuspis	0.1	10	MBU31-13	Det by M Hislop (WAH).
Senna symonii	0.1	80	MBU31-14	
Sporobolus australasicus	0.1	15		
Trianthema triquetrum	0.1	2	MBU31-06	
Triodia longiceps	45	60	MBU31-01	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Goodenia nuda **TPFL Pop. No:**

OBSERVATION DATE: 7/3/2020 **CONSERVATION STATUS:** P4 New population: ☒

OBSERVER/S Rachel Warner **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 3.3 km northwest of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.866245 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.12826 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☒	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Chert, mudstone, sandstone, quartz		Alluvial loamy sand	Dark reddish brown	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low isolated trees (Eucalyptus leucophloia subsp. leucophloia, Corymbia hamersleyana)
2. Tall sparse shrubland (Acacia tumida var. pilbarensis)
3. Sparse shrubland (Acacia trachycarpa, Androcalva luteiflora)
4. Sparse hummock grassland (Triodia epactia, T. longiceps)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Chryspogon fallax, Calytrix carinata, Bonamia erecta, Petalostylis labicheoides, Sesbania cannabina

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Cattle present, a few weeds

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Goodenia nuda* population described on the TPRF.

Biota TPRF reference: 1509_GOOnud_TPRF_03

Marble Bar Rd Upgrade **Site** MBU35

Described by RW,RM **Date** 07-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 203180 mE, 7579228 mN 120.127985°E, -21.865966°S

Habitat Creek bed and bank.

Soil Dark reddish brown (5YR 3/3) alluvial loamy sand.

Rock Type Chert, mudstone, sandstone, quartz.

Vegetation *Eucalyptus leucophloia* subsp. *leucophloia, Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* tall open shrubland over *Acacia trachycarpa, Androcalva luteiflora* open shrubland over *Triodia epactia,* (*T. longiceps*) very open hummock grassland with *Chrysopogon fallax* very open tussock grassland.

Veg Condition Very Good: cattle present; a few weeds.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Acacia acradenia	0.1	60	MBU35-04	
Acacia bivenosa	0.1	190		
Acacia eriopoda	0.1	220	MBU35-27	PLDK: leaves longer; marginal veins.
Acacia maitlandii	0.1	130	MBU35-02	
Acacia spondylophylla	0.1	90		
Acacia trachycarpa	5	140	MBU10-01=	
Acacia trachycarpa x tumida var. *pilbarensis*	0.1	170	MBU35-19	
Acacia tumida var. *pilbarensis*	8	450	MBU35-24	
Androcalva luteiflora	3	190	MBU35-25	
Aristida contorta	0.1	20		
Aristida holathera var. *holathera*	0.1	30		
Aristida ? pruinosa	0.1	60	MBU35-23	Lemma furrow smooth. Det confirmed by M Hislop (WAH): lemma furrows are smooth rather than tuberculate, however that character is known to 'wobble'.
Bonamia erecta	0.1	25	MBU19-09=	
Bulbostylis barbata	0.1	5		
Calandrinia sp.	0.1	5	MBU35-01	Inadequate material.
Calytrix carinata	0.1	130	MBU35-06	Sens lat.
**Cenchrus ciliaris*	0.1	30		NI=30.
**Cenchrus setiger*	0.1	30		NI= 2
Chrysopogon fallax	5	60		
Corchorus parviflorus	0.1	35	MBU10-08A=	
Corymbia hamersleyana	0.5	500		
Cymbopogon ambiguus	0.1	60	MBU35-16	
Dampiera candicans	0.1	30		
Duperreya commixta	0.1	30		
Eragrostis cumingii	0.1	20		
Eragrostis eriopoda	0.1	30	MBU35-05	
Eragrostis olida	0.1	60	MBU35-26	Det confirmed by M Hislop (WAH).
Eriachne benthamii	0.1	30	MBU35-18	
Eucalyptus leucophloia subsp. *leucophloia*	0.5	400		

Species	Cover	Height	Specimen	Notes
Eulalia aurea	0.1	50		
Evolvulus alsinoides var. *decumbens*	0.1	20		
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Fimbristylis microcarya	0.1	40	MBU35-20	PLDK: sens. lat.; nutlets without or with poorly formed tubercles. Nut without projections.
Gonocarpus ephemerus	0.1	15	MBU35-14	
Goodenia cusackiana	0.1	5	MBU35-07	
Goodenia microptera	0.1	30	MBU35-09	
Goodenia nuda	0.1	20	MBU35-15	
Goodenia stobbsiana	0.1	35	MBU35-17	
Grevillea wickhamii subsp. *hispidula*	0.1	210	MBU35-12	
Hakea lorea subsp. *lorea*	0.1	200	MBU35-13	PLDK: sens. lat.
Hibiscus sturtii var. *campylochlamys*	0.1	20	MBU35-03	
Hybanthus aurantiacus	0.1	40		
Indigofera monophylla	0.1	70		NI= 27.
Paraneurachne muelleri	0.1	35		
Paspalidium rarum	0.1	20	MBU35-08	
Petalostylis labicheoides	0.1	210		
Pluchea dentex	0.1	30		
Ptilotus fusiformis	0.1	30	MBU35-21	
Santalum lanceolatum	0.1	170	MBU35-10	
Senna symonii	0.1	90	MBU35-11	
Sesbania cannabina	0.1	60		
Solanum diversiflorum	0.1	30		
Sporobolus australasicus	0.1	5		
Themeda triandra	0.1	120		
Trigastrotheca molluginea	0.1	20		
Triodia epactia	5	30	MBU19-01=	PLDK: sens. lat.
Triodia longiceps	2	40		
Waltheria indica	0.1	25		

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Ipomoea racemigera **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Rachel Warner **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 27.4 km southwest of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.087718 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.994772 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Mudstone		Alluvial sand	Yellowish red	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix)
2. Low woodland (Acacia coriacea subsp. pendens, Atalaya hemiglauca)
3. Tall open shrubland (Melaleuca glomerata)
4. Open grassland (*Cenchrus setiger, *Echinochloa colona)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia ampliceps, Alysicarpus muelleri, Cyperus vaginatus, Eulalia aurea, Triodia longiceps.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☒ Good ☒ Degraded ☐ Completely degraded ☐

COMMENT: Very Good to Good: moderate *Cenchrus cover and other weeds, cattle.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Ipomoea racemigera* population described on the TPRF.

Biota TPRF reference: 1509_IPOrac_TPRF_01

Marble Bar Rd Upgrade **Site** MBU51

Described by RW,AL **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 809040 mE, 7554459 mN 119.994822°E, -22.087334°S

Habitat Major creek bed with islands.

Soil Yellowish red alluvial sand.

Rock Type Mudstone.

Vegetation *Eucalyptus victrix* woodland over *Acacia coriacea* subsp. *pendens,* (*Atalaya hemiglauca*) low woodland over *Melaleuca glomerata* tall shrubland over **Cenchrus setiger* , (**Echinochloa colona*) open tussock grassland.

Veg Condition Good to Poor: moderate **Cenchrus* cover and other weeds present; light grazing by cattle.

Fire Age No sign of recent fire.

Notes Small pools of water in creek bed.

Species	Cover	Height	Specimen	Notes
Acacia ampliceps	0.1	130		
Acacia coriacea subsp. *pendens*	15	600		
Alternanthera denticulata	0.1	25	MBU51-10	
Alysicarpus muelleri	0.1	20	MBU51-46	
Amaranthus undulatus	0.1	90	MBU51-33	
Ammannia multiflora	0.1	25	MBU51-38, -47	Herb, in wet area.
Arivela viscosa	0.1	40		
Atalaya hemiglauca	2	130		
Boerhavia coccinea	0.1	20	MBU51-41	Sens lat.
Bulbostylis barbata	0.1	5	MBU51-06	
Calandrinia tepperiana	1	20	MBU51-08	Pink and white flowers. PLDK: petals <7; matches MBU30-55.
**Cenchrus ciliaris*	0.1	45		NI=10
**Cenchrus setiger*	20	120		NI=1000
Centipeda minima subsp. *macrocephala*	0.1	5	MBU51-32	
Chara sp.	0.1	20	MBU51-49	Aquatic algae. In water pool.
**Citrullus colocynthis*	0.1	45	MBU51-43	NI=5.
Corchorus parviflorus	0.1	35	MBU51-11	
Corchorus tridens	0.1	20	MBU51-20	
Crotalaria medicaginea var. *neglecta*	0.1	30		
Cucumis variabilis	0.1	35		
Cyperus difformis	0.1	40	MBU51-15	
Cyperus iria	0.1	25	MBU51-05	
Cyperus ixiocarpus	0.1	40	MBU51-37	
Cyperus squarrosus	0.1	20	MBU51-01	
Cyperus vaginatus	0.1	35		
Dactyloctenium radulans	0.1	2		
**Echinochloa colona*	1	25	MBU51-25	
Eragrostis crateriformis	0.1	35	MBU51-04	PLDK: matches MBU54-46.
Eragrostis cumingii	0.1	35	MBU51-03	
Eucalyptus victrix	20	1400	MBU51-14	
Eulalia aurea	0.1	80	MBU51-27	PLDK: sens. lat.
Euphorbia australis var. *subtomentosa*	0.1	2	MBU51-31	

Species	Cover	Height	Specimen	Notes
**Euphorbia hirta*	0.1	20	MBU51-30	
Euphorbia trigonosperma	0.1	30	MBU51-22	
Fimbristylis depauperata	0.1	20	MBU51-07	
Goodenia lamprosperma	0.1	35	MBU51-29	
Hybanthus aurantiacus	0.1	20	MBU51-36	PLDK: sens. lat.
Ipomoea muelleri	0.1	25	MBU51-26	
Ipomoea polymorpha	0.1	20	MBU51-45	
Ipomoea racemigera	0.1	35	MBU51-42	
Lipocarpha microcephala	0.1	25	MBU51-28	
Ludwigia perennis	0.1	25	MBU51-39	Herb.
**Malvastrum americanum*	0.1	40		NI=2
Marsilea hirsuta	0.1	2	MBU51-48	
Melaleuca glomerata	12	250	MBU51-34	White paperbark strips.
Melaleuca linophylla	0.1	140	MBU51-35	Papery bark, creamy brown.
Notoleptopus decaisnei	0.1	10	MBU51-09	
Phyllanthus maderaspatensis	0.1	25		
**Physalis angulata*	0.1	30	MBU51-17	
Pluchea dentex	0.1	5	MBU51-18	
Pluchea rubelliflora	0.1	10	MBU51-23	
Plumbago zeylanica	0.1	25	MBU51-19	NI=1.
Portulaca intraterranea	0.1	20	MBU51-16	Det confirmed by M Hislop (WAH): all identifications in the *P. oleracea* complex are tentative pending much-needed revision of this difficult group.
Pterocaulon sphacelatum	0.1	2	MBU51-40	Juvenile.
Rostellularia adscendens var. *clementii*	0.1	25	MBU51-13	
Sesbania cannabina	0.1	30		
Solanum horridum	0.1	3	MBU51-50	
Sporobolus australasicus	0.1	20	MBU51-02	
Stemodia grossa	0.1	15	MBU51-21	
Triodia longiceps	0.1	30	MBU51-12	
**Vachellia farnesiana*	0.1	110		NI=1
Vigna lanceolata var. *lanceolata*	0.1	30	MBU51-24	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	35	MBU51-44	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Ipomoea racemigera **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 9.9 km north of Walter Road in Nullagine, on the eastern side of Marble Bar Road

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -21.804222 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 120.10748 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 80x10 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other: Loamy alluvial sand	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low open woodland (Eucalyptus victrix)

2. Tall sparse shrubland (Acacia trachycarpa)

3. Sparese hummock grassland (Triodia longiceps)

4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia coriacea subsp. pendens, Alternanthera nana, Hybanthus aurantiacus, Pluchea dentex, Waltheria indica.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☒ Degraded ☐ Completely degraded ☐

COMMENT: Cattle and weeds present, flood damage.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Ipomoea racemigera* population described on the TPRF.

Biota TPRF reference: 1509_IPOrac_TPRF_02

Marble Bar Rd Upgrade **Site** MBU30

Described by AL,MET **Date** 07-Mar-20 **Type** Quadrat 80 x 10 m

MGA Zone 51 200936 mE, 7586073 mN 120.107537°E, -21.803823°S

Habitat Creek bed; high flow area.

Soil Weak red (2.5YR 5/2) loamy alluvial sand.

Rock Type N/A.

Vegetation *Eucalyptus victrix* low open woodland over *Acacia trachycarpa* tall open shrubland over *Triodia longiceps* very open hummock grassland.

Veg Condition Poor: cattle and weeds present; flood damage.

Fire Age Very long unburnt.

Notes Quadrat established to fit irregular area of high flow creek bed. Only one plant of soft spinifex; consider excluding for floristic analysis.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	90	MBU30-42	
Acacia coriacea subsp. *pendens*	0.1	90		Juvenile.
Acacia trachycarpa	10	300		flood killed.
Aeschynomene indica	0.1	25	MBU30-06	
Alternanthera nana	0.1	20		
Amaranthus undulatus	0.1	40	MBU30-04, -35	
Arivela viscosa	0.1	40	MBU30-09. -33	
Bergia pedicellaris	0.1	5	MBU30-38	
**Bidens bipinnata*	0.1	25	MBU30-39	
Boerhavia burbidgeana	0.1	10	MBU30-31	
Boerhavia coccinea	0.1	12	MBU30-03	Sens lat.
Bulbostylis barbata	0.1	15	MBU30-48	
Calandrinia tepperiana	0.1	12	MBU30-55	PLDK: petals <7. Det confirmed by M Hislop (WAH).
Cassytha capillaris	0.1	40	MBU30-16	Creeper.
**Cenchrus ciliaris*	0.1	20		
**Cenchrus setiger*	0.1	60	MBU30-05	
Chloris pumilio	0.1	25	MBU30-41	
Chrysopogon fallax	0.1	70	MBU30-10	
Commelina ensifolia	0.1	30	MBU30-52	
Corchorus parviflorus	0.1	70	MBU30-13	
Corchorus tridens	0.1	6	MBU30-51	
Cucumis picrocarpus	0.1	40	MBU30-08	
Cucumis variabilis	0.1	50	MBU30-07	
Cullen leucanthum	0.1	20	MBU30-56	Juvenile.
Cyperus bulbosus	0.1	20	MBU30-47	Det by M Hislop (WAH).
Cyperus iria	0.1	40	MBU30-25	
Cyperus squarrosus	0.1	5	MBU30-37	
Dactyloctenium radulans	0.1	5		
**Echinochloa colona*	0.1	55	MBU30-26	
**Eragrostis cilianensis*	0.1	25	MBU30-21	
Eragrostis crateriformis	0.1	40	MBU30-28	
Eragrostis cumingii	0.1	15	MBU30-22	
Eragrostis leptocarpa	0.1	20	MBU30-23	
Eucalyptus victrix	10	10		
Eulalia aurea	0.1	15	MBU30-11	PLDK: sens. lat.

Species	Cover	Height	Specimen	Notes
Euphorbia australis var. *subtomentosa*	0.1	1	MBU30-50	Prostrate.
Euphorbia trigonosperma	0.1	30	MBU30-17	Erect herb.
Evolvulus alsinoides var. *decumbens*	0.1	30	MBU30-20	
Fimbristylis depauperata	0.1	35	MBU30-24	
Fimbristylis microcarya	0.1	30	MBU30-27	
Gomphrena cunninghamii	0.1	20	MBU30-49	
Goodenia lamprosperma	0.1	25		
Gossypium australe	0.1	15		Juvenile. Burrup Peninsula form: greener indumentum.
Hybanthus aurantiacus	0.1	25	MBU30-15	PLDK: sens. lat.
Indigofera hirsuta	0.1	10	MBU30-45A	Juvenile. MET det.
Indigofera linifolia	0.1	10		
Indigofera linnaei	0.1	30	MBU30-30	
Indigofera monophylla	0.1	100	MBU30-12	
Ipomoea muelleri	0.1	20	Flowers mauve. Creeper.	
Ipomoea polymorpha	0.1	10	MBU30-19	Annual.
Ipomoea racemigera	0.1	50	MBU30-02	Flowers white.
Ludwigia perennis	0.1	50	MBU30-54	
Paspalidium rarum	0.1	12	MBU30-36	
Perotis rara	0.1	10		
Phyllanthus maderaspatensis	0.1	30		
Pluchea dentex	0.1	15	MBU30-32	
Pluchea rubelliflora	0.1	15	MBU30-29	
Polymeria ambigua	0.1	10	MBU30-40, -44	
Portulaca oleracea/intraterranea	0.1	5	MBU30-18	PLDK: seeds faintly nippled.
Sida fibulifera	0.1	15	MBU30-45	Spreading to 45cm. PLDK: sens. lat.
Sida rohlenae subsp. *rohlenae*	0.1	20	MBU30-46	
Solanum diversiflorum	0.1	20		
Sorghum plumosum var. *plumosum*	0.1	118	MBU30-43	
Stemodia grossa	0.1	7		
Trianthema triquetrum	0.1	8	MBU30-34	
Triodia epactia	0.1	50	MBU30-53	PLDK: sens. lat.
Triodia longiceps	10	60	MBU30-01	Blue green leaves.
Vigna lanceolata var. *lanceolata*	0.1	40	MBU30-14	Creeper.
Waltheria indica	0.1	40		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Ipomoea racemigera **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Michi Maier **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 52.0 km south-southwest of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM:

GDA94 / MGA94 ☒

AGD84 / AMG84 ☐

WGS84 ☐

Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)

DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.292324

Long / Easting: 119.943723

ZONE:

METHOD USED:

GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix, Acacia coriacea subsp. pendens)
2. Grassland (*Cenchrus ciliaris, *C. setiger)
3. Isoloated sedges (Cyperus vaginatus)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☐ Degraded ☒ Completely degraded ☐

COMMENT: Weeds, grazing

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted]erty Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Ipomoea racemigera **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S Ayesha Lapinski **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 52.0 km south-southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.292368 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.944678 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☒	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Calcrete, basalt				
Closed depression ☐	Specific **Landform** Element		Floodplain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low open woodland (Euaclyptus victrix, Acacia coriacea subsp. pendens)
2. Open hummock grassland (Triodia longiceps, T. epactia)
3. Isolated grasses (*Cenchrus ciliaris, *C. setiger)
4. Open forbland (Indigofera linifolia, I. linnaei, Pluchea rubelliflora, Euphorbia biconvexa)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Sporobolus australasicus, Eragrostis tenellula, Digitaria ctenantha, Eragrostis desertorum, Melhania oblongifolia.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Cattle scats and tracks, some weeds.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Ipomoea racemigera* population described on the TPRF.

Biota TPRF reference: 1509_IPOrac_TPRF_04

Marble Bar Rd Upgrade **Site** MBU62

Described by AL,BRM **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 803394 mE, 7531874 mN 119.944411°E, -22.292097°S

Habitat Floodplain.

Soil Strong brown (7.5YR 4/6) sandy loam.

Rock Type Calcrete, basalt (some outcropping).

Vegetation *Eucalyptus victrix,* (*Acacia coriacea* subsp. *pendens*) low open woodland over *Triodia longiceps,* (*T. epactia*) open hummock grassland with **Cenchrus ciliaris, *C. setiger* scattered tussock grasses and *Sporobolus australasicus,* (*Eragrostis tenellula, Dactyloctenium radulans*) open annual grassland over *Indigofera linifolia, I. linnaei, Pluchea rubelliflora, Euphorbia biconvexa* open herbland.

Veg Condition Very Good: cattle scat, tracks; **Cenchrus* and other weeds present.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	10	MBU62-47	PLDK: sens. lat.
Acacia ampliceps	0.1	90		Juvenile.
Acacia bivenosa	0.1	60		
Acacia coriacea subsp. *pendens*	0.5	350	MBU62-17	Pendulous foliage. Some dead.
Acacia pyrifolia var. *pyrifolia*	0.1	110		
**Aerva javanica*	0.1	30		NI=10.
Alternanthera nana	0.1	20		
Alysicarpus muelleri	0.1	40		
Amaranthus undulatus	0.1	50	MBU62-43	Sterile.
Arivela viscosa	0.1	60		
Boerhavia burbidgeana	0.1	30	MBU62-39	PLDK: indumentum atypical; some type 2 hairs on older stems.
**Cenchrus ciliaris*	2	80		
**Cenchrus setiger*	0.5	30		
Centipeda minima subsp. *macrocephala*	0.1	8	MBU62-29	Sterile.
Chloris pumilio	0.1	20	MBU62-18	
**Citrullus colocynthis*	0.1	30	MBU47-51=	
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	20	MBU50-25=	
Corchorus tridens	0.1	15	MBU62-10	
Cucumis variabilis	0.1	70		
Cullen leucanthum	0.1	30	MBU62-27	
Cyperus squarrosus	0.1	20	MBU62-08	
Dactyloctenium radulans	1	15		
Digitaria ctenantha	0.1	40	MBU62-35	
Dysphania plantaginella	0.1	20	MBU62-28	
Dysphania rhadinostachya subsp. *rhadinostachya*	0.1	20	MBU62-40	
**Echinochloa colona*	0.1	30	MBU62-02	
Enneapogon caerulescens	0.1	15	MBU62-19	
Eragrostis cumingii	0.1	15		
Eragrostis desertorum	0.1	45	MBU62-15	Woolly butt.
Eragrostis dielsii	0.1	7	MBU62-20	
Eragrostis leptocarpa	0.1	35	MBU62-14	
Eragrostis tenellula	4	50	MBU62-09, -	

Species	Cover	Height	Specimen	Notes
			31	
Eucalyptus victrix	3	850		
Euphorbia biconvexa	3	35	MBU62-07	
Euphorbia tannensis subsp. *eremophila*	0.1	30	MBU62-22	
Euphorbia vaccaria var. *erucoides*	0.1	10	MBU62-04	
Evolvulus alsinoides var. *villosicalyx*	0.1	20		
Glycine canescens	0.1	30		
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU62-23	Pink flowers.
Gomphrena cunninghamii	0.1	10		
Indigofera colutea	0.1	12		
Indigofera linifolia	5	30	REL19-09=	
Indigofera linnaei	4	12	REL19-18=	
Indigofera trita subsp. *trita*	0.1	30	MBU62-06	
Ipomoea polymorpha	0.1	20	MBU62-05	
Ipomoea racemigera	0.1	20	MBU62-25	
**Malvastrum americanum*	0.1	30		
Melaleuca linophylla	0.1	160	MBU62-16	
Melhania oblongifolia	0.1	25		
Notoleptopus decaisnei	0.1	25	MBU47-41=	
Perotis rara	0.1	10		
**Physalis angulata*	0.1	40		Flowers yellow. Dentate-ovate leaves.
Pluchea rubelliflora	3	20	MBU62-03	
Polymeria ambigua	0.1	5	MBU62-38	
Portulaca filifolia	0.1	15	MBU62-26	Yellow flowers.
Portulaca oleracea/intraterranea	0.1	10		
Pterocaulon sphacelatum	0.1	10	MBU62-30	
Ptilotus auriculifolius	0.1	20		
Ptilotus exaltatus	0.1	30		
Rhynchosia minima	0.1	60		
Senna notabilis	0.1	45		
Sida echinocarpa	0.1	30	MBU62-44, -45	Juvenile.
Solanum lasiophyllum	0.1	30		
**Solanum nigrum*	0.1	15	MBU62-46	
Sporobolus actinocladus	0.1	35		
Sporobolus australasicus	8	20		
Stemodia grossa	0.1	10		
Swainsona stenodonta	0.1	30	MBU62-42	
Synaptantha tillaeacea var. *tillaeacea*	0.1	4	MBU62-34	
Tephrosia sp. Newman (A.A. Mitchell PRP 29)	0.1	25	MBU62-33	Orange flowers. PLDK: atypical indumentum, R. Butcher.
Trianthema triquetrum	0.1	15		
Tribulus hirsutus	0.1	10		
Tribulus sp. long-styled *eichlerianus* (A.S. George 10666)	0.1	10	MBU47-40=	
Trichodesma zeylanicum var. *zeylanicum*	0.1	15		
Triodia epactia	5	40		
Triodia longiceps	10	110		
Triraphis mollis	0.1	45	MBU62-36	

Species	Cover	Height	Specimen	Notes
**Vachellia farnesiana*	0.1	30		NI=3. Juveniles.
Zaleya galericulata subsp. *galericulata*	0.1	30	MBU62-41	White flowers.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Ipomoea racemigera **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 55.6 km south-southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.322313 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.939321 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				2
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix, Acacia coriacea subsp. pendens)
2. Grassland (*Cenchrus ciliaris, *C. setiger)
3. Isoloated sedges (Cyperus vaginatus)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☐ Degraded ☒ Completely degraded ☐

COMMENT: Weeds, grazing

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
White flowers.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Nicotiana umbratica **TPFL Pop. No:**

OBSERVATION DATE: 10/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 11.7 km south of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.982729

Long / Easting: 120.091264

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				2
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☒	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Basalt and granite				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia inaequilatera)
2. Hummock grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Indigofera monophylla, Goosypium australe, Tribulus hirsutus, Gomphrena cunninghamii

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Only occasionally scattered weeds

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
S-facing sheltered spot, at base of large granite boulder, 35 cm tall.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Nicotiana umbratica **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 47.9 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.251479

Long / Easting: 119.933835

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				5
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☒	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Basalt and granite				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia inaequilatera)
2. Hummock grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Indigofera monophylla, Goosypium australe, Tribulus hirsutus, Gomphrena cunninghamii

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Only occasionally scattered weeds

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Juveniles growing in shade of small overhang on top of ridge

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479) **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 19.9 km southwest of Walter Road in Nullagine, on the northwestern side of Marble Bar Road

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.039858

Long / Easting: 120.039124

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☒	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☒	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Kylena formation; basalt		cracking		
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse forbland (Sida fibulifera, Neptunia diamorphantha, Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)
2. Open annual grassland (Cynodon convergens)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Desmodium campylocaulon, Goodenia muelleriana, Ptilotus gomphrenoides.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus setiger, old cattle tracks

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (formerly *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) population described on the TPRF.

Biota TPRF reference: 1509_OLDsph_TPRF_01

Marble Bar Rd Upgrade **Site** MBU55

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 194364 mE, 7559832 mN 120.039142°E, -22.039458°S

Habitat Area of cracking clay on crest of low basalt rise; gentle slope to SW.

Soil Red (2.5YR4/6) light clay; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Sida fibulifera, Neptunia dimorphantha, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273) very open herbland with *Cynodon convergens* open annual grassland.

Veg Condition Very Good: a few plants of **Cenchrus setiger*; old cattle scats; a few bits of rubbish.

Fire Age No sign of recent fire.

Notes Conditions are very dry; lots of annuals still present but likely to be missing very delicate/short-lived spp.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	10	MBU55-35	
Alysicarpus muelleri	0.1	15	MBU55-27	PLDK: unusual form; decumbent.
Aristida contorta	0.1	15	MBU55-33A	
Aristida latifolia	0.1	15	MBU55-21	
Arivela viscosa	0.1	35	MBU55-03	
Boerhavia paludosa	0.1	12	MBU55-07	
**Cenchrus setiger*	0.1	15		
Chloris pectinata	0.1	12	MBU55-18	
Corchorus tridens	0.1	3	MBU55-19	
Crotalaria medicaginea var. *neglecta*	0.1	15	MBU55-11	
Cucumis picrocarpus	0.1	10	MBU55-25	
Cynodon convergens	20	7		
Dactyloctenium radulans	0.1	7		
Desmodium campylocaulon	0.1	20	MBU55-16A	
Desmodium muelleri	0.1	20	MBU55-09, -23	
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU55-13	
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MBU55-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU55-30	
Gomphrena cunninghamii	0.1	7		
Goodenia muelleriana	0.1	7	MBU55-17	
Heliotropium conocarpum	0.1	10	MBU55-10	
Heliotropium tanythrix	0.1	15	MBU55-32	Det confirmed by M Hislop (WAH).
Hibiscus brachysiphonius	0.1	10	MBU55-24A	Flowers mauve.
Indigofera colutea	0.1	5		
Indigofera linifolia	0.1	15		
Indigofera trita subsp. *trita*	0.1	12	MBU55-22A	
Iseilema vaginiflorum	0.1	5	MBU55-20	
Neptunia dimorphantha	1	6	MBU55-05	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	10	MBU55-12A	
Paspalidium retiglume	0.1	15	MBU55-16	
Phyllanthus maderaspatensis	0.1	15	MBU55-29	

Species	Cover	Height	Specimen	Notes
Portulaca intraterranea	0.1	7	MBU55-02	PLDK: matches MBU51-16.
Portulaca oleracea/intraterranea	0.1	5	MBU55-01	
Ptilotus aervoides	0.1	3	MBU55-28	
Ptilotus gomphrenoides	0.1	10	MBU55-34	PLDK: sens. lat.
Rhynchosia minima	0.1	5	MBU55-09A	
Rostellularia adscendens var. *clementii*	0.1	7	MBU55-26	
Sclerolaena costata	0.1	12	MBU55-31	
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.1	20	MBU55-33	MET det.
Sida fibulifera	1	10	MBU55-04	PLDK: sens. lat.
Sporobolus australasicus	0.1	8		
Streptoglossa liatroides	0.1	6	MBU55-08	
Swainsona thompsoniana	0.1	10	MBU55-12	MET det.
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.5	5	MBU55-06	
Trianthema triquetrum	0.1	5	MBU55-22B	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	5	MBU55-15	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S Rebecca Mason **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 52.8 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.298958 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.942625 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☒	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Chert, ironstone and basalt		Clay	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Hummock grassland (Triodia epactia)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Abutilon macrum, Acacia inqequilatera, Enneapogon caerulescens, Hakea lorea subsp. lorea.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. Flowers blue.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (formerly *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) population described on the TPRF.

Biota TPRF reference: 1509_OLDsph_TPRF_02

Marble Bar Rd Upgrade **Site** MBU66
Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 50 803175 mE, 7531155 mN 119.942424°E, -22.298622°S
Habitat Stony undulating plain.
Soil Reddish brown clay.
Rock Type Chert, basalt, ironstone.
Vegetation *Triodia epactia* hummock grassland.
Veg Condition Excellent.
Fire Age Very long unburnt.
Notes Some patches of cracking clay are spread throughout the site and general area.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	15	MBU66-30	
Acacia coriacea subsp. *pendens*	0.1	650	MBU66-54	
Acacia inaequilatera	0.1	3		
Acacia pruinocarpa	0.1	650	MBU66-01	
Aristida contorta	0.1	30		
Aristida latifolia	0.1	45	MBU66-41	
Arivela viscosa	0.1	15	MBU66-04	
Austrobryonia pilbarensis	0.1	15	MBU66-46	Prostrate.
**Bidens bipinnata*	0.1	25		NI=50.
Blumea tenella	0.1	10	MBU66-42	
Boerhavia burbidgeana	0.1	10	MBU66-10	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia paludosa	0.1	60	MBU66-49	
Bonamia pilbarensis	0.1	25	MBU66-05	
Bulbostylis barbata	0.1	7	MBU66-07	
Bulbostylis turbinata	0.1	12	MBU66-28	
**Cenchrus setiger*	0.1	40		NI=10.
Corchorus tridens	0.1	15	MBU66-17	
Crotalaria dissitiflora subsp. *benthamiana*	0.1	20	MBU66-36	
Cucumis variabilis	0.1	25	MBU66-15	
Dactyloctenium radulans	0.1	7		
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU66-21	
Enneapogon caerulescens	0.1	25	MBU66-12	
Enneapogon polyphyllus	0.1	15		
Eragrostis cumingii	0.1	30	MBU66-44	
Eragrostis leptocarpa	0.1	50	MBU66-50	
Eragrostis tenellula	0.1	25	MBU66-51	
Eriachne flaccida	0.1	40	MBU66-47	
Euphorbia biconvexa	0.1	35	MBU66-16	
Euphorbia coghlanii	0.1	2	MBU66-52	
Evolvulus alsinoides var. *villosicalyx*	0.1	12	MBU66-13	
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU66-29	
Gomphrena cunninghamii	0.1	7	MBU66-23	
Goodenia muelleriana	0.1	10	MBU66-02	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	5	MBU66-37	Corky bark. PLDK: sens. lat.
Heliotropium cunninghamii	0.1	12	MBU66-14	
Heliotropium heteranthum	0.1	2	MBU66-20	Prostrate.
Indigastrum parviflorum	0.1	25	MBU66-33	

Species	Cover	Height	Specimen	Notes
Indigofera colutea	0.1	15		
Indigofera linifolia	0.1	20		
Indigofera linnaei	0.1	20	MBU66-27	
Iseilema dolichotrichum	0.1	10	MBU66-06	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU66-43	Flowers blue.
Operculina aequisepala	0.1	30		
Panicum laevinode	0.1	60	MBU66-45	
Paspalidium clementii	0.1	20	MBU66-25	
Phyllanthus maderaspatensis	0.1	12	MBU66-31	
Polycarpaea corymbosa var. *corymbosa*	0.1	8		
Polycarpaea holtzei	0.1	4	MBU66-48	
Polygala glaucifolia	0.1	2	MBU66-09	
Portulaca oleracea/intraterranea	0.1	5	MBU66-08	PLDK: seeds distinctly nippled.
Ptilotus aervoides	0.1	5		
Ptilotus auriculifolius	0.1	15		
Ptilotus carinatus	0.1	15	MBU66-40	
Rhynchosia minima	0.1	5	MBU66-24	
Sclerolaena cornishiana	0.1	25	MBU66-53	
Senna notabilis	0.1	5	MBU66-19	
Sida echinocarpa	0.1	12	MBU66-22	
Sida fibulifera	0.1	10	MBU66-39	Prostrate 1m across. PLDK: sens. lat.
Solanum phlomoides	0.1	3	MBU66-38	Juvenile.
Sporobolus australasicus	0.1	15		
Streptoglossa bubakii	0.1	5	MBU66-18	
Swainsona stenodonta	0.1	35	MBU66-11	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	15	MBU66-26	Flowers light orange.
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	0.1	90	MBU66-32	NI=25.
Tragus australianus	0.1	12		
Tribulus hirsutus	0.1	7	MBU66-35	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10	MBU66-34	Juvenile.
Triodia brizoides	0.1	30		
Triodia epactia	40	40	MBU66-03	PLDK: sens. lat.
Triodia longiceps	0.1	80		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479) **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 22.0 km southwest of Walter Road in Nullagine, on the southeastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.053875

Long / Easting: 120.025171

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Kylena formation; basalt		Cracking clay loam	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse shrubland (Acacia synchronicia)
2. Low isolated shrubs (Senna hamersleyensis x S. sp. Karijini (M.E. Trudgen 10392)
3. Open hummock grassland (Triodia longiceps, T. epactia)
4. Open forbland (Neptunia diamorphantha)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Cullen graveolens, Eragrostis leptocarpa, Ipomoea muelleri, Sclerolaena costata.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus spp. And *Aerva, cattle scats.

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (formerly *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) population described on the TPRF.

Biota TPRF reference: 1509_OLDsph_TPRF_03

Marble Bar Rd Upgrade **Site** MBU46

Described by RM,SC **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 192950 mE, 7558250 mN 120.025160°E, -22.053483°S

Habitat Plain; mosaic of stony soil and patches of cracking clay.

Soil Reddish brown clay loam; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Acacia synchronicia* open shrubland over *Senna hamersleyensis* x *S.* sp. Karijini (M.E. Trudgen 10392) scattered low shrubs over *Triodia longiceps, T. epactia* open hummock grassland over *Neptunia dimorphantha* open herbland with *Sporobolus australasicus* very open annual grassland.

Veg Condition Very Good: small amount of **Cenchrus* spp. and **Aerva*; cattle scats.

Fire Age Burnt 3-5 years ago.

Notes Typical clay spp. present.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	15	MBU46-19	
Acacia synchronicia	3	150		
**Aerva javanica*	0.1	30		NI=1.
Alysicarpus muelleri	0.1	20	MBU15-01=	
Aristida latifolia	0.1	30	MBU46-28	
Arivela viscosa	0.1	20		
Boerhavia coccinea	0.1	15	MBU45-03=	Sens lat.
Bulbostylis turbinata	0.1	5	MBU46-27	
**Cenchrus ciliaris*	0.1	30		NI=100
**Cenchrus setiger*	0.1	30		
Chloris pectinata	0.1	10	MBU46-06	
Corchorus tridens	0.1	5	REL12-15=	
Crotalaria medicaginea var. *neglecta*	0.1	10		
Cullen graveolens	0.1	10	MBU46-14	On clay.
Cynodon convergens	0.1	5	MBU46-07	PLDK: spike length intermediate between taxa. Det confirmed by M Hislop (WAH).
Dactyloctenium radulans	0.1	5		
Desmodium campylocaulon	0.1	10	MBU46-20	
Desmodium muelleri	0.1	20	MBU46-21	
Dichanthium sericeum subsp. *humilius*	0.1	20		
Enneapogon caerulescens	0.1	20	MBU46-29	
Eragrostis leptocarpa	0.1	60	MBU46-10	
Eragrostis tenellula	0.1	10	MBU46-11	
Eriachne mucronata (typical form)	0.1	20	MBU46-24	
Eriachne pulchella	0.1	5		
Euphorbia inappendiculata var. *inappendiculata*	0.1	5	MBU46-12	Det confirmed by M Hislop (WAH).
Euphorbia trigonosperma	0.1	15	MBU46-23	
Evolvulus alsinoides var. *villosicalyx*	0.1	5		
Goodenia muelleriana	0.1	20	MBU46-22	Sens. lat.
Hibiscus brachysiphonius	0.1	10	SC27=	Prostrate.
Ipomoea muelleri	0.1	20	REL08-04=	
Neptunia dimorphantha	25	5	MBU46-01	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU46-13	

Species	Cover	Height	Specimen	Notes
Phyllanthus maderaspatensis	0.1	10	MBU46-17	
Portulaca oleracea/intraterranea	0.1	5		
Ptilotus gomphrenoides	0.1	10	MBU46-18	PLDK: sens. lat.
Rhynchosia minima	0.1	5		
Rostellularia adscendens var. *clementii*	0.1	5	MBU46-15	
Sclerolaena cornishiana	0.1	25	MBU46-25	
Sclerolaena costata	0.1	10	MBU46-26	
Senna glutinosa subsp. *x luerssenii*	0.1	30		
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.5	10	MBU46-03	MET det.
Sida fibulifera	0.1	10	MBU46-08	PLDK: sens. lat.
Sporobolus australasicus	9	5		
Streptoglossa liatroides	0.1	10	MBU46-09	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	5	MBU46-30	On clay.
Trianthema triquetrum	0.1	10		
Tribulus hirsutus	0.1	10		
Triodia epactia	10	40	MBU46-16	
Triodia longiceps	10	60		



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Paspalidium retiglume **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P2 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 19.9 km southwest of Walter Road in Nullagine, on the northwestern side of Marble Bar Road

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.039858

Long / Easting: 120.039124

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:
Crest ☒
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☐
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other:
Kylena formation; basalt

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☐
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☐
Sandy loam ☐
Loam ☐
Clay loam ☐
Light clay ☒
Peat ☐
Specify other:
cracking

SOIL COLOUR:
Red ☒
Brown ☐
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other:

DRAINAGE:
Well drained ☐
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse forbland (Sida fibulifera, Neptunia diamorphantha, Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)
2. Open annual grassland (Cynodon convergens)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Desmodium campylocaulon, Goodenia muelleriana, Ptilotus gomphrenoides.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus setiger, old cattle tracks

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Paspalidium retiglume* population described on the TPRF.

Biota TPRF reference: 1509_PASret_TPRF_01

Marble Bar Rd Upgrade **Site** MBU55

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 194364 mE, 7559832 mN 120.039142°E, -22.039458°S

Habitat Area of cracking clay on crest of low basalt rise; gentle slope to SW.

Soil Red (2.5YR4/6) light clay; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Sida fibulifera, Neptunia dimorphantha, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273) very open herbland with *Cynodon convergens* open annual grassland.

Veg Condition Very Good: a few plants of **Cenchrus setiger*; old cattle scats; a few bits of rubbish.

Fire Age No sign of recent fire.

Notes Conditions are very dry; lots of annuals still present but likely to be missing very delicate/short-lived spp.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	10	MBU55-35	
Alysicarpus muelleri	0.1	15	MBU55-27	PLDK: unusual form; decumbent.
Aristida contorta	0.1	15	MBU55-33A	
Aristida latifolia	0.1	15	MBU55-21	
Arivela viscosa	0.1	35	MBU55-03	
Boerhavia paludosa	0.1	12	MBU55-07	
**Cenchrus setiger*	0.1	15		
Chloris pectinata	0.1	12	MBU55-18	
Corchorus tridens	0.1	3	MBU55-19	
Crotalaria medicaginea var. *neglecta*	0.1	15	MBU55-11	
Cucumis picrocarpus	0.1	10	MBU55-25	
Cynodon convergens	20	7		
Dactyloctenium radulans	0.1	7		
Desmodium campylocaulon	0.1	20	MBU55-16A	
Desmodium muelleri	0.1	20	MBU55-09, -23	
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU55-13	
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MBU55-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU55-30	
Gomphrena cunninghamii	0.1	7		
Goodenia muelleriana	0.1	7	MBU55-17	
Heliotropium conocarpum	0.1	10	MBU55-10	
Heliotropium tanythrix	0.1	15	MBU55-32	Det confirmed by M Hislop (WAH).
Hibiscus brachysiphonius	0.1	10	MBU55-24A	Flowers mauve.
Indigofera colutea	0.1	5		
Indigofera linifolia	0.1	15		
Indigofera trita subsp. *trita*	0.1	12	MBU55-22A	
Iseilema vaginiflorum	0.1	5	MBU55-20	
Neptunia dimorphantha	1	6	MBU55-05	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	10	MBU55-12A	
Paspalidium retiglume	0.1	15	MBU55-16	
Phyllanthus maderaspatensis	0.1	15	MBU55-29	

Species	Cover	Height	Specimen	Notes
Portulaca intraterranea	0.1	7	MBU55-02	PLDK: matches MBU51-16.
Portulaca oleracea/intraterranea	0.1	5	MBU55-01	
Ptilotus aervoides	0.1	3	MBU55-28	
Ptilotus gomphrenoides	0.1	10	MBU55-34	PLDK: sens. lat.
Rhynchosia minima	0.1	5	MBU55-09A	
Rostellularia adscendens var. *clementii*	0.1	7	MBU55-26	
Sclerolaena costata	0.1	12	MBU55-31	
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.1	20	MBU55-33	MET det.
Sida fibulifera	1	10	MBU55-04	PLDK: sens. lat.
Sporobolus australasicus	0.1	8		
Streptoglossa liatroides	0.1	6	MBU55-08	
Swainsona thompsoniana	0.1	10	MBU55-12	MET det.
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.5	5	MBU55-06	
Trianthema triquetrum	0.1	5	MBU55-22B	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	5	MBU55-15	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Rhagodia sp. Hamersley (M. Trudgen 17794) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 61.8 km south-southwest of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.384824

Long / Easting: 119.973894

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:
Crest ☐
Hill ☒
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☐
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other:
Basalt ?ironstone and chert

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☐
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☐
Sandy loam ☐
Loam ☐
Clay loam ☒
Light clay ☐
Peat ☐
Specify other:

SOIL COLOUR:
Red ☒
Brown ☒
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other:
Dark reddish brown

DRAINAGE:
Well drained ☐
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Isolated tall shrubs (Acacia inaequilatera, A. pruinocarpa)
2. Hummock grassland (Triodia wiseana)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Enneapogon polyphyllus, Ptilotus astrolasius, Tribulus suberosus, Triodia scintilians

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Rhagodia* sp. Hamersley (M. Trudgen 17794*)* population described on the TPRF.

Biota TPRF reference: 1509_RHAsph_TPRF_01

Marble Bar Rd Upgrade **Site** MBU60

Described by MM, JK **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 806198 mE, 7521560 mN 119.973570°E, -22.384653°S

Habitat Crest and slope of low stony rise.

Soil Dark reddish brown (5YR 3/4) clay loam.

Rock Type Basalt, ?ironstone and chert.

Vegetation *Acacia inaequilatera,* (*A. pruinocarpa*) scattered tall shrubs over *Triodia wiseana* hummock grassland.

Veg Condition Excellent.

Fire Age Very long unburnt.

Species	Cover	Height	Specimen	Notes
Acacia inaequilatera	1	400		
Acacia pruinocarpa	0.25	250		
Aristida contorta	0.1	15		
Arivela viscosa	0.1	35		
Boerhavia coccinea	0.1	30		
Corchorus parviflorus	0.1	30	MBU60-03	
Cucumis variabilis	0.1	140		
Dysphania sp.	0.1	2		Juvenile, sterile; inadequate material for det.
Enneapogon caerulescens	0.1	20		
Enneapogon polyphyllus	0.1	25		
Eriachne mucronata (typical form)	0.1	45		
Eriachne pulchella	0.1	15		
Euphorbia tannensis subsp. *eremophila*	0.1	35		
Euphorbia vaccaria var. *erucoides*	0.1	15	MBU60-07	
Gomphrena kanisii	0.1	10	MBU60-02	
Goodenia microptera	0.1	40	MBU60-13	
Hakea lorea subsp. *lorea*	0.1	70		
Haloragis gossei var. *gossei*	0.1	20		
Hybanthus aurantiacus	0.1	15		
Indigofera monophylla	0.1	80	MBU60-11	
Oldenlandia crouchiana	0.1	10		
Paraneurachne muelleri	0.1	25		
Paspalidium clementii	0.1	20		
Polygala glaucifolia	0.1	10	MBU60-01	
Portulaca oleracea/intraterranea	0.1	20		
Ptilotus aervoides	0.1	5	MBU60-10	
Ptilotus astrolasius	0.1	25		
Ptilotus auriculifolius	0.1	10		
Ptilotus exaltatus	0.1	20		
Ptilotus obovatus var. *obovatus*	0.1	60		
Rhagodia sp. Hamersley (M. Trudgen 17794)	0.1	200		NI=1
Senna artemisioides subsp. *oligophylla*	0.1	20	MBU60-06	
Senna glutinosa subsp. *glutinosa*	0.1	180		
Senna glutinosa subsp. *pruinosa*	0.1	80		
Senna glutinosa subsp. x *luerssenii*	0.1	170	MBU60-04, -09	
Senna notabilis	0.1	10		
Sporobolus australasicus	0.1	20		

Streptoglossa bubakii	0.1	15		
Swainsona stenodonta	0.1	15	MBU60-08	
Tribulus hirsutus	0.1	15		
Tribulus suberosus	0.1	50		
Trichodesma zeylanicum var. *zeylanicum*	0.1	40		
Triodia longiceps	0.1	60		
Triodia scintillans	0.1	40	MBU60-12	
Triodia wiseana	35	70	MBU60-05	PLDK: sens. lat.; long lemma lobe form.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Rhagodia sp. Hamersley (M. Trudgen 17794) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 58.9 km south-southwest of Walter Road in Nullagine, on the southwestern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.357947

Long / Easting: 119.963532

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Hummock grassland (Triodia longiceps, T. wiseana)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia bivenosa, A. synchronicia, Aristida contorta, Ptilotus aervoides.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF). The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_RHAsph_TPRF_02

Species	Date	Biota Site	Latitude	Longitude	Abundance
Rhagodia sp. Hamersley (M. Trudgen 17794)	13/3/20	OPP-MM	-22.357842	119.963364	1
Rhagodia sp. Hamersley (M. Trudgen 17794)	13/3/20	OPP-MM	-22.357947	119.963532	1
Rhagodia sp. Hamersley (M. Trudgen 17794)	13/3/20	OPP-MM	-22.357998	119.963678	1
Rhagodia sp. Hamersley (M. Trudgen 17794)	13/3/20	OPP-MM	-22.3581	119.963545	1

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 14/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):
Approximately 1.6 km northwest of Walter Road in Nullagine, on the southeastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.878341

Long / Easting: 120.118995

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				1
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☒	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia synchronicia, Indigofera monophylla, Cynodon prostratus, Heliotropium chrysocarpum, Sclerolaena cuneata.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Pristine to Excellent

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: Additional records

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The table below contains additional locations of individuals recorded by Biota within the population described on the attached TPRF; (the red text refers to the record that is described in the TPRF). The habitat and vegetation details described in the TPRF also apply to these records.

Biota TPRF reference: 1509_SOLspm_TPRF_01

Species	Date	Biota Site	Latitude	Longitude	Abundance	Comments
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	12/3/20	OPP-MM	-21.87762	120.120064	0	Already found in this area by WoodGIS; number not recorded to avoid duplication.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-MM	-21.87808	120.119377	1	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	12/3/20	OPP-MM	-21.87834	120.119372	0	Already found in this area by WoodGIS; number not recorded to avoid duplication.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-MM	-21.87834	120.11884	1	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-MM	-21.87834	120.118995	1	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	12/3/20	OPP-MM	-21.87834	120.118434	0	Already found in this area by WoodGIS; number not recorded to avoid duplication.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-MM	-21.87838	120.119033	1	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-MM	-21.8784	120.119042	7	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-JK	-21.87852	120.118063	1	
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	14/3/20	OPP-JK	-21.87864	120.118757	6	

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 60.5 km south-southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.374954 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.973169 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				19
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 25x100 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				19

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☒	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Ironstone/dolomite?		Sandy clay loam	Reddish brown	
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Hummock grassland (Triodia longiceps, T. wiseana)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia bivenosa, Abutilon lepidum, Eragrostis xerophila, Sida fibulifera.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Det by M Hislop (WAH).

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Solanum* sp. Mosquito Creek (A.A. Mitchell et. al AAM10795) population described on the TPRF.

Biota TPRF reference: 1509_SOLspm_TPRF_02

Marble Bar Rd Upgrade **Site** MBU69

Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 25 x 100 m

MGA Zone 50 806162 mE, 7522693 mN 119.973003°E, -22.374438°S

Habitat Low stony rise; gentle slope to E.

Soil Reddish brown sandy clay loam.

Rock Type Ironstone/dolomite?

Vegetation *Triodia longiceps, (T. wiseana)* hummock grassland.

Veg Condition Very Good: small amount of disturbance.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon lepidum	0.1	10	MBU69-21	PLDK: sens. lat.
Acacia bivenosa	0.1	190	MBU69-16	PLDK: sens. lat.
Acacia synchronicia	0.1	120	MBU69-04	PLDK: sens. lat.
Boerhavia coccinea	0.1	15	MBU69-08A	
**Cenchrus setiger*	0.1	100		NI=1.
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	110	MBU69-07, -25	
Corymbia hamersleyana	0.1	600	MBU69-01	Sens lat.
Cucumis variabilis	0.1	20	MBU69-27	
Cymbopogon ambiguus	0.1	80	MBU69-29	
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU69-24	
Enneapogon caerulescens	0.1	15	MBU69-13	
Enneapogon polyphyllus	0.1	10		
Eragrostis xerophila	0.1	30	MBU69-10	
Euphorbia australis var. *subtomentosa*	0.1	4	MBU69-09	
Euphorbia biconvexa	0.1	15	MBU69-22	
Euphorbia boophthona	0.1	40	MBU69-32	
Evolvulus alsinoides var. *villosicalyx*	0.1	35	MBU69-26	
Hakea lorea subsp. *lorea*	0.1	4	MBU69-12	PLDK: sens. lat.
Haloragis gossei var. *gossei*	0.1	10	MBU69-23	
Indigofera monophylla	0.1	140	MBU69-17	
Notoleptopus decaisnei	0.1	10		
Phyllanthus maderaspatensis	0.1	25		
Ptilotus auriculifolius	0.1	8		
Ptilotus exaltatus	0.1	4		
Rhynchosia minima	0.1	90	MBU69-11	
Sclerolaena cornishiana	0.1	20	MBU69-28	
Senna artemisioides subsp. *helmsii*	0.1	100	MBU69-05	
Senna artemisioides subsp. *oligophylla*	0.1	100	MBU69-03	
Senna glutinosa subsp. *pruinosa*	0.1	85	MBU69-14	
Senna glutinosa subsp. x *luerssenii*	0.1	90	MBU69-06	
Senna notabilis	0.1	15		
Sida fibulifera	0.1	10	MBU69-20	PLDK: sens. lat.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	0.1	70	MBU69-33	NI=19. Det by M Hislop (WAH).
Sporobolus australasicus	0.1	30		
Swainsona stenodonta	0.1	35	MBU69-19	
Tephrosia rosea var. *clementii*	0.1	50	MBU69-18	
Tribulus hirsutus	0.1	10	MBU69-02	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10	MBU69-08	

Triodia longiceps	60	100	MBU69-31	
Triodia wiseana	2	40	MBU69-30	Cover not recorded; estimated from site photo. PLDK: sens. lat.; long lemma lobe form.
Triodia wiseana	2	75	MBU69-15	Long lemma lobes, hairy leaves.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 8/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 1.6 km south-southeast of Walter Road in Nullagine, on the western side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.898746

Long / Easting: 120.11313

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 60x40 Data attached ☒ Total area of quadrats (m^2): 2400

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐				Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Isolated shrubs (Acacia bivenosa)
2. Hummock grassland (Triodia longiceps)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia synchronicia, Chrysopogon fallax, Eucalyptus leucophloia subsp. leucophloia, Sida fibulifera

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Cattle scats and tracks

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Solanum* sp. Mosquito Creek (A.A. Mitchell et. al AAM10795) population described on the TPRF.

Biota TPRF reference: 1509_SOLspm_TPRF_03

Marble Bar Rd Upgrade **Site** MBU42

Described by AL,MET **Date** 08-Mar-20 **Type** Quadrat 60 x 40 m

MGA Zone 51 201681 mE, 7575595 mN 120.112835°E, -21.898494°S

Habitat Plain, with slight SW-facing slope with very small drainage lines.

Soil Reddish brown (2.5YR 4/4) clay loam.

Rock Type N/A for quadrat; Mosquito Creek Formation, located near shale outcrop.

Vegetation *Acacia bivenosa* scattered shrubs over *Triodia longiceps* hummock grassland.

Veg Condition Very Good: cattle scats, tracks; road drain at S edge of quadrat.

Fire Age No sign of recent fire.

Notes Patches of *Acacia bivenosa* in slight flow areas.

Species	Cover	Height	Specimen	Notes
Acacia bivenosa	0.5	200	MBU42-10	PLDK: sens. lat.
Acacia synchronicia	0.1	70	MBU42-13	
Chrysopogon fallax	0.1	85	MBU42-17	1 plant.
Cynodon prostratus	0.1	5	MBU42-07	
Dactyloctenium radulans	0.1	7		
Eucalyptus leucophloia subsp. *leucophloia*	0.1	220		Overhanging; rooted just outside quadrat.
Fimbristylis dichotoma	0.1	20	MBU42-16	PLDK: sens. lat.; style ciliate in upper portion.
Hibiscus coatesii	0.1	80	MBU42-03	
Hibiscus sturtii var. *grandiflorus*	0.1	30	MBU42-04	
Indigofera monophylla	0.1	140	MBU42-11	In slight flow area.
Maireana ? eriosphaera	0.1	60	MBU42-09	PLDK: sterile; but most likely based on distribution, leaf shape and indumentum.
Pluchea ferdinandi-muelleri	0.1	50	MBU42-01	
Portulaca oleracea/intraterranea	0.1	2		
Sclerolaena cuneata	0.1	15	MBU42-08, -14	
Sclerolaena hostilis	0.1	50	MBU42-15	
Senna symonii	0.1	120		
Sida fibulifera	0.1	15	MBU42-05	PLDK: sens. lat.
Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	0.1	70	MBU42-12	Number not recorded, entered as N=1. PLDK: matches MBU69-33.
Sporobolus australasicus	0.1	10		
Trianthema triquetrum	0.1	10	MBU42-06	
Triodia longiceps	70	120	MBU42-02	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 1.1 km south-southeast of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -21.894231

Long / Easting: 120.113511

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☒	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia synchronicia, Indigofera monophylla, Cynodon prostratus, Heliotropium chrysocarpum, Sclerolaena cuneata.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Pristine to Excellent

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Already found in this area by WoodGIS; number not recorded to avoid duplication.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 49.0 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.262829

Long / Easting: 119.937088

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☒	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☒	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☒	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Robe pisolite/ironstone			Reddish brown	
Closed depression ☐	Specific **Landform** Element		Hillslope: west-facing		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low isolated shrubs (Senna glutinosa subsp. glutinosa x subsp. x luerssenii)
2. Hummock grassland (Triodia longiceps)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia bivenosa, Corchorus parviflorus, Paspalidium clementii, Streptoglossa decurrens.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some ground disturbance (pits and erosion)

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795) **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P1 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 1.8 km south-southeast of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM:
GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)
DecDegrees ☒ DegMinSec ☐ UTMs ☐
Lat / Northing: -21.900429
Long / Easting: 120.114895
ZONE:

METHOD USED:
GPS ☒ Differential GPS ☐ Map ☐
No. satellites: Map used:
Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☐
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☒	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole to	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐
Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☒	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia bivenosa)
2. Isolated shrubs (Senna symonii)
3. Hummock grassland (Triodia longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia synchronicia, Indigofera monophylla, Cynodon prostratus, Heliotropium chrysocarpum, Sclerolaena cuneata.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Pristine to Excellent

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Already found in this area by WoodGIS; number not recorded to avoid duplication.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Swainsona thompsoniana **TPFL Pop. No:**

OBSERVATION DATE: 9/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 19.9 km southwest of Walter Road in Nullagine, on the northwestern side of Marble Bar Road

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.039858

Long / Easting: 120.039124

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:
Crest ☒
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☐
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other:
Kylena formation; basalt

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☐
10-30% ☐
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☐
Sandy loam ☐
Loam ☐
Clay loam ☐
Light clay ☒
Peat ☐
Specify other:
cracking

SOIL COLOUR:
Red ☒
Brown ☐
Yellow ☐
White ☐
Grey ☐
Black ☐
Specify other:

DRAINAGE:
Well drained ☐
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Sparse forbland (Sida fibulifera, Neptunia diamorphantha, Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)
2. Open annual grassland (Cynodon convergens)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Aristida latifolia, Desmodium campylocaulon, Goodenia muelleriana, Ptilotus gomphrenoides.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Some scattered *Cenchrus setiger, old cattle tracks

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. MET det.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Swainsona thompsoniana* population described on the TPRF.

Biota TPRF reference: 1509_SWAtho_TPRF_01

Marble Bar Rd Upgrade **Site** MBU55

Described by MM,MET **Date** 09-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 51 194364 mE, 7559832 mN 120.039142°E, -22.039458°S

Habitat Area of cracking clay on crest of low basalt rise; gentle slope to SW.

Soil Red (2.5YR4/6) light clay; cracking.

Rock Type Kylena Formation; basalt.

Vegetation *Sida fibulifera, Neptunia dimorphantha, Tephrosia* sp. clay soils (S. van Leeuwen et al. PBS 0273) very open herbland with *Cynodon convergens* open annual grassland.

Veg Condition Very Good: a few plants of **Cenchrus setiger*; old cattle scats; a few bits of rubbish.

Fire Age No sign of recent fire.

Notes Conditions are very dry; lots of annuals still present but likely to be missing very delicate/short-lived spp.

Species	Cover	Height	Specimen	Notes
Abutilon malvifolium	0.1	10	MBU55-35	
Alysicarpus muelleri	0.1	15	MBU55-27	PLDK: unusual form; decumbent.
Aristida contorta	0.1	15	MBU55-33A	
Aristida latifolia	0.1	15	MBU55-21	
Arivela viscosa	0.1	35	MBU55-03	
Boerhavia paludosa	0.1	12	MBU55-07	
**Cenchrus setiger*	0.1	15		
Chloris pectinata	0.1	12	MBU55-18	
Corchorus tridens	0.1	3	MBU55-19	
Crotalaria medicaginea var. *neglecta*	0.1	15	MBU55-11	
Cucumis picrocarpus	0.1	10	MBU55-25	
Cynodon convergens	20	7		
Dactyloctenium radulans	0.1	7		
Desmodium campylocaulon	0.1	20	MBU55-16A	
Desmodium muelleri	0.1	20	MBU55-09, -23	
Dichanthium sericeum subsp. *humilius*	0.1	10		
Enneapogon caerulescens	0.1	15	MBU55-13	
Euphorbia inappendiculata var. *inappendiculata*	0.1	3	MBU55-14	
Evolvulus alsinoides var. *villosicalyx*	0.1	10	MBU55-30	
Gomphrena cunninghamii	0.1	7		
Goodenia muelleriana	0.1	7	MBU55-17	
Heliotropium conocarpum	0.1	10	MBU55-10	
Heliotropium tanythrix	0.1	15	MBU55-32	Det confirmed by M Hislop (WAH).
Hibiscus brachysiphonius	0.1	10	MBU55-24A	Flowers mauve.
Indigofera colutea	0.1	5		
Indigofera linifolia	0.1	15		
Indigofera trita subsp. *trita*	0.1	12	MBU55-22A	
Iseilema vaginiflorum	0.1	5	MBU55-20	
Neptunia dimorphantha	1	6	MBU55-05	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	10	MBU55-12A	
Paspalidium retiglume	0.1	15	MBU55-16	
Phyllanthus maderaspatensis	0.1	15	MBU55-29	

Species	Cover	Height	Specimen	Notes
Portulaca intraterranea	0.1	7	MBU55-02	PLDK: matches MBU51-16.
Portulaca oleracea/intraterranea	0.1	5	MBU55-01	
Ptilotus aervoides	0.1	3	MBU55-28	
Ptilotus gomphrenoides	0.1	10	MBU55-34	PLDK: sens. lat.
Rhynchosia minima	0.1	5	MBU55-09A	
Rostellularia adscendens var. *clementii*	0.1	7	MBU55-26	
Sclerolaena costata	0.1	12	MBU55-31	
Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	0.1	20	MBU55-33	MET det.
Sida fibulifera	1	10	MBU55-04	PLDK: sens. lat.
Sporobolus australasicus	0.1	8		
Streptoglossa liatroides	0.1	6	MBU55-08	
Swainsona thompsoniana	0.1	10	MBU55-12	MET det.
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.5	5	MBU55-06	
Trianthema triquetrum	0.1	5	MBU55-22B	
Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	0.1	5	MBU55-15	



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Themeda ? sp. Hamersley Station (M.E. Trudgen 11431) **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** ?P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 44.1 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.215171 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.932682 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☒	Yellow ☐	inundated ☐
Outcrop ☐	Ironstone ☒	10-30% ☐	Clay loam ☐	White ☐	Permanently
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	inundated ☐
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Calcrete, ironstone and mudstone				
Closed depression ☐	Specific **Landform** Element		Hillslope: east-facing		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Low open mallee woodland (Eucalyptus socialis subsp. eucentrica)
2. Tall sparse shrubland (Acacia bivenosa)
3. Hummock grassland (Triodia wiseana, T. longiceps)
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Chrysopogon fallax, Indigofera monophylla, Ptilotus clementii, Scaevola spinescens, Streptoglossa bubakii

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Cattle and donkey scats, pockets of *Cenchrus

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat. MET det.

DRF PERMIT/ LICENCE No: FB62000106 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) population described on the TPRF.

Biota TPRF reference: 1509_THEsph_TPRF_01

Marble Bar Rd Upgrade **Site** MBU50

Described by AL,BRM **Date** 12-Mar-20 **Type** Quadrat 50 x 50 m

MGA Zone 50 802336 mE, 7540462 mN 119.932538°E, -22.214799°S

Habitat Gently sloping E-facing undulating rise, upslope of drainage line.

Soil Brown (7.5YR 4/3) loam.

Rock Type Calcrete, ironstone, mudstone.

Vegetation *Eucalyptus socialis* subsp. *eucentrica* low open mallee woodland over *Acacia bivenosa* tall open shrubland over *Triodia wiseana,* (*T. longiceps*) hummock grassland.

Veg Condition Very Good: cattle scat, tracks; donkey scats; pockets of **Cenchrus*.

Fire Age No sign of recent fire.

Species	Cover	Height	Specimen	Notes
Abutilon cunninghamii	0.1	80	MBU50-13	Amongst mallee.
Acacia bivenosa	3	250		
Acacia coriacea subsp. *pendens*	0.1	190	MBU50-24	Long narrow phyllodes.
Arivela viscosa	0.1	40		
Capparis umbonata	0.1	90		
**Cenchrus ciliaris*	0.1	40		NI=50.
Chrysopogon fallax	0.1	100		
Corchorus lasiocarpus subsp. *lasiocarpus*	0.1	30	MBU50-25	
Corchorus tridens	0.1	10	MBU50-06	
Cucumis variabilis	0.1	20		
Dysphania sphaerosperma	0.1	10	MBU50-21	
Enneapogon cylindricus	0.1	10	MBU50-14	
Enneapogon polyphyllus	0.1	20	MBU50-20	PLDK: sens. lat.
Eragrostis desertorum	0.1	60	MBU50-16, -32	
Eremophila longifolia	0.1	70	MBU50-17	Sterile. NI=4.
Eucalyptus socialis subsp. *eucentrica*	7	450	MBU50-08	Mallee; horned buds, socks to 1m, light grey-salmon bark above.
Euphorbia vaccaria var. *erucoides*	0.1	5	MBU50-05	
Evolvulus alsinoides var. *villosicalyx*	0.1	10		
Goodenia microptera	0.1	5	MBU50-30	
Heliotropium chrysocarpum	0.1	25	MBU50-04	
Heliotropium cunninghamii	0.1	15	MBU50-15	
Hibiscus coatesii	0.1	25	MBU50-12	
Hibiscus sturtii var. *campylochlamys*	0.1	20	MBU50-27	
Indigofera monophylla	0.1	120	MBU50-29	
Notoleptopus decaisnei	0.1	20		
Paraneurachne muelleri	0.1	30		
Pluchea ferdinandi-muelleri	0.1	50	MBU50-11	
Polygala glaucifolia	0.1	3	MBU49-04=	
Ptilotus clementii	0.1	10	MBU50-23	
Ptilotus exaltatus	0.1	40		
Scaevola amblyanthera var. *centralis*	0.1	30	MBU50-28	PLDK: sens. lat.
Scaevola spinescens	0.1	60	MBU50-02	
Sclerolaena cornishiana	0.1	20	MBU50-18	
Senna notabilis	0.1	5		
Senna symonii	0.1	110	MBU50-10, 19, 26	
Sida echinocarpa	0.1	25	MBU50-31	

Species	Cover	Height	Specimen	Notes
Sida fibulifera	0.1	10	MBU50-22	PLDK: sens. lat.
Solanum horridum	0.1	10	MBU50-33	
Sporobolus australasicus	0.1	20		
Stackhousia muricata subsp. annual (W.R. Barker 2172)	0.1	10	MBU49-01=	
Streptoglossa bubakii	0.1	5	MBU48-05=	
Streptoglossa decurrens	0.1	5	MBU49-21=	
Tephrosia clementii	0.1	15	MBU50-09	
Themeda ? sp. Hamersley Station (M.E. Trudgen 11431)	0.1	70	MBU50-07	Poor material.
Tribulus hirsutus	0.1	5		
Triodia longiceps	2.5	80	MBU50-03	
Triodia wiseana	40	60	MBU50-01	PLDK: sens. lat.; long lemma lobe form.



Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Themeda sp. Hamersley Station (M.E. Trudgen 11431) **TPFL Pop. No:**

OBSERVATION DATE: 12/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 50.5 km south-southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: **COORDINATES:** (If UTM coords provided, **Zone** is also required) **METHOD USED:**

GDA94 / MGA94 ☒ DecDegrees ☒ DegMinSec ☐ UTMs ☐ GPS ☒ Differential GPS ☐ Map ☐

AGD84 / AMG84 ☐ **Lat / Northing:** -22.276558 No. satellites: Map used:

WGS84 ☐ **Long / Easting:** 119.94103 Boundary polygon captured ☐ Map Scale:

Unknown ☐ **ZONE:**

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count Method: Actual count - individuals

(Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				5
Dead				

Area of pop (m^2):

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

[redacted]

•

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☒	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☒	Dolerite ☐		Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Basalt and granite				
Closed depression ☐	Specific **Landform** Element				
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Tall isolated shrubs (Acacia inaequilatera)
2. Hummock grassland (Triodia epactia)
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Indigofera monophylla, Goosypium australe, Tribulus hirsutus, Gomphrena cunninghamii

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: Only occasionally scattered weeds

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

Threatened and Priority Flora Report Form

Version 1.3 August 2017

ATTACHED: Map ☐ [redacted] Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Themeda sp. Hamersley Station (M.E. Trudgen 11431) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 59.3 km south-southwest of Walter Road in Nullagine, on the southwestern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.361937

Long / Easting: 119.965945

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count Method: (Refer to field manual for list)

WHAT COUNTED: Plants Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				0
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m^2):

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☒
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	10-30% ☐	Clay loam ☒	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☒	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Fluvial			Reddish brown	
Closed depression ☐	Specific **Landform** Element		Wadi		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Woodland (Eucalyptus victrix)
2. Low isolated trees (Acacia coriacea subsp. pendens, Atalaya hemiglauca)
3. Tall isolated shrubs (Acacia tumida var. pilbarensis, A. pyrifolia var. pyrifolia)
4. Tussock grassland (*Cenchrus setiger, *C. ciliaris)

ASSOCIATED SPECIES:
Other (non-dominant) spp

Acacia pruinocarpa, Triodia longiceps, Acacia bivenosa, Rhynchosia minima, Chrysopogon fallax

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☒ Degraded ☐ Completely degraded ☐

COMMENT: Dense weeds, grazing

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)
Number of individuals not recorded; 0.1% cover recorded in quadrat.

DRF PERMIT/ LICENCE No: FB62000033 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: _____ **Sheet No.:** _____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au under *Standard Report Forms*

TAXON: Themeda sp. Hamersley Station (M.E. Trudgen 11431) **TPFL Pop. No:**

OBSERVATION DATE: 13/3/2020 **CONSERVATION STATUS:** P3 New population: ☒

OBSERVER/S [redacted] **PHONE:** 9328 1900

ROLE: Botanist **ORGANISATION:** Biota Environmental Sciences

DESCRIPTION OF LOCATION (Provide at least nearest town/names locality, and the distance and direction to that place):

Approximately 52.8 km southwest of Walter Road in Nullagine, on the eastern side of Marble Bar Road.

Reserve no:

DBCA DISTRICT: Pilbara region **LGA:** Shire of East Pilbara Land manager present:☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☒ DegMinSec ☐ UTMs ☐

Lat / Northing: -22.298958

Long / Easting: 119.942625

ZONE:

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured ☐ Map Scale:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☒ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole to Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m^2):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m^2:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count Method: Estimate

(Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive				25
Dead				

Area of pop (m^2):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. 1 Size 50x50 Data attached ☒ Total area of quadrats (m^2): 2500

Summary Quad. Totals: Alive				25

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: %

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS – type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential impact (L-E)**	**Potential Threat Onset (S-L)**
• Complete vegetation clearing - Main Roads WA	N	H	M
• Weed invasion - General	L	M	M
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☒	Well drained ☐
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☒	10-30% ☐	Clay loam ☐	White ☐	Permanently inundated ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☐	
Flat ☒	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	Tidal ☐
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐	Chert, ironstone and basalt		Clay	Reddish brown	
Closed depression ☐	Specific **Landform** Element		Plain		
Wetland ☐	(Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1.** Banksia woodland (B. attenuata, B. illicifolia); **2.** Open shrubland (Hibbertia sp., Acacia spp.); **3.** Isolated clumps of sedges (Mesomelaena tetragona)

1. Hummock grassland (Triodia epactia)
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Abutilon macrum, Acacia inqequilatera, Enneapogon caerulescens, Hakea lorea subsp. lorea.

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formation should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☒ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions – include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: FB62000035 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website/ Any actions carried out under the licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: Main Roads

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Submitter of Record: [redacted] Role: Botanist Signed: [redacted] Date: 2 / 2 / 2021

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ☐

Data to Accompany Threatened and Priority Report Form (TPRF).

The data below is from a quadrat established by Biota within the *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) population described on the TPRF.

Biota TPRF reference: 1509_THEsph_TPRF_04

Marble Bar Rd Upgrade **Site** MBU66
Described by RM,MET **Date** 13-Mar-20 **Type** Quadrat 50 x 50 m
MGA Zone 50 803175 mE, 7531155 mN 119.942424°E, -22.298622°S
Habitat Stony undulating plain.
Soil Reddish brown clay.
Rock Type Chert, basalt, ironstone.
Vegetation *Triodia epactia* hummock grassland.
Veg Condition Excellent.
Fire Age Very long unburnt.
Notes Some patches of cracking clay are spread throughout the site and general area.

Species	Cover	Height	Specimen	Notes
Abutilon macrum	0.1	15	MBU66-30	
Acacia coriacea subsp. *pendens*	0.1	650	MBU66-54	
Acacia inaequilatera	0.1	3		
Acacia pruinocarpa	0.1	650	MBU66-01	
Aristida contorta	0.1	30		
Aristida latifolia	0.1	45	MBU66-41	
Arivela viscosa	0.1	15	MBU66-04	
Austrobryonia pilbarensis	0.1	15	MBU66-46	Prostrate.
**Bidens bipinnata*	0.1	25		NI=50.
Blumea tenella	0.1	10	MBU66-42	
Boerhavia burbidgeana	0.1	10	MBU66-10	PLDK: indumentum atypical; some type 2 hairs on older stems.
Boerhavia paludosa	0.1	60	MBU66-49	
Bonamia pilbarensis	0.1	25	MBU66-05	
Bulbostylis barbata	0.1	7	MBU66-07	
Bulbostylis turbinata	0.1	12	MBU66-28	
**Cenchrus setiger*	0.1	40		NI=10.
Corchorus tridens	0.1	15	MBU66-17	
Crotalaria dissitiflora subsp. *benthamiana*	0.1	20	MBU66-36	
Cucumis variabilis	0.1	25	MBU66-15	
Dactyloctenium radulans	0.1	7		
Dichanthium sericeum subsp. *humilius*	0.1	40	MBU66-21	
Enneapogon caerulescens	0.1	25	MBU66-12	
Enneapogon polyphyllus	0.1	15		
Eragrostis cumingii	0.1	30	MBU66-44	
Eragrostis leptocarpa	0.1	50	MBU66-50	
Eragrostis tenellula	0.1	25	MBU66-51	
Eriachne flaccida	0.1	40	MBU66-47	
Euphorbia biconvexa	0.1	35	MBU66-16	
Euphorbia coghlanii	0.1	2	MBU66-52	
Evolvulus alsinoides var. *villosicalyx*	0.1	12	MBU66-13	
Gomphrena affinis subsp. *pilbarensis*	0.1	15	MBU66-29	
Gomphrena cunninghamii	0.1	7	MBU66-23	
Goodenia muelleriana	0.1	10	MBU66-02	Sens. lat.
Hakea lorea subsp. *lorea*	0.1	5	MBU66-37	Corky bark. PLDK: sens. lat.
Heliotropium cunninghamii	0.1	12	MBU66-14	
Heliotropium heteranthum	0.1	2	MBU66-20	Prostrate.
Indigastrum parviflorum	0.1	25	MBU66-33	

Species	Cover	Height	Specimen	Notes
Indigofera colutea	0.1	15		
Indigofera linifolia	0.1	20		
Indigofera linnaei	0.1	20	MBU66-27	
Iseilema dolichotrichum	0.1	10	MBU66-06	
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	0.1	5	MBU66-43	Flowers blue.
Operculina aequisepala	0.1	30		
Panicum laevinode	0.1	60	MBU66-45	
Paspalidium clementii	0.1	20	MBU66-25	
Phyllanthus maderaspatensis	0.1	12	MBU66-31	
Polycarpaea corymbosa var. *corymbosa*	0.1	8		
Polycarpaea holtzei	0.1	4	MBU66-48	
Polygala glaucifolia	0.1	2	MBU66-09	
Portulaca oleracea/intraterranea	0.1	5	MBU66-08	PLDK: seeds distinctly nippled.
Ptilotus aervoides	0.1	5		
Ptilotus auriculifolius	0.1	15		
Ptilotus carinatus	0.1	15	MBU66-40	
Rhynchosia minima	0.1	5	MBU66-24	
Sclerolaena cornishiana	0.1	25	MBU66-53	
Senna notabilis	0.1	5	MBU66-19	
Sida echinocarpa	0.1	12	MBU66-22	
Sida fibulifera	0.1	10	MBU66-39	Prostrate 1m across. PLDK: sens. lat.
Solanum phlomoides	0.1	3	MBU66-38	Juvenile.
Sporobolus australasicus	0.1	15		
Streptoglossa bubakii	0.1	5	MBU66-18	
Swainsona stenodonta	0.1	35	MBU66-11	
Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	0.1	15	MBU66-26	Flowers light orange.
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	0.1	90	MBU66-32	NI=25.
Tragus australianus	0.1	12		
Tribulus hirsutus	0.1	7	MBU66-35	
Trichodesma zeylanicum var. *zeylanicum*	0.1	10	MBU66-34	Juvenile.
Triodia brizoides	0.1	30		
Triodia epactia	40	40	MBU66-03	PLDK: sens. lat.
Triodia longiceps	0.1	80		



Appendix 14

Flora Species Recorded During the Current Survey

Family	Species	Status
Acanthaceae	*Dicladanthera forrestii*	
	Rostellularia adscendens var. *clementii*	
Aizoaceae	*Trianthema cusackianum*	
	**Trianthema portulacastrum*	Weed
	Trianthema triquetrum	
	Zaleya galericulata subsp. *galericulata*	
Amaranthaceae	*Achyranthes aspera*	
	**Aerva javanica*	Weed
	Alternanthera angustifolia	
	Alternanthera denticulata	
	Alternanthera nana	
	Alternanthera nodiflora	
	Amaranthus cuspidifolius	
	Amaranthus ? interruptus	
	Amaranthus undulatus	
	Gomphrena affinis subsp. *pilbarensis*	
	Gomphrena canescens subsp. *canescens*	
	Gomphrena cunninghamii	
	Gomphrena kanisii	
	Ptilotus aervoides	
	Ptilotus astrolasius	
	Ptilotus auriculifolius	
	Ptilotus axillaris	
	Ptilotus calostachyus	
	Ptilotus carinatus	
	Ptilotus clementii	
	Ptilotus exaltatus	
	Ptilotus fusiformis	
	Ptilotus gomphrenoides	
	Ptilotus helipteroides	
	Ptilotus incanus	
	Ptilotus obovatus var. *obovatus*	
	Ptilotus rotundifolius	
	Ptilotus schwartzii	
Apocynaceae	**Calotropis procera*	Weed
	Carissa lanceolata	
	Cynanchum pedunculatum	
	Cynanchum viminale subsp. *australe*	
	Marsdenia angustata	
	Vincetoxicum lineare	
Araliaceae	*Trachymene oleracea subsp. oleracea*	
Asteraceae	**Bidens bipinnata*	Weed
	Blumea tenella	
	Centipeda minima subsp. *macrocephala*	
	**Flaveria trinervia*	Weed
	Pentalepis trichodesmoides subsp. *trichodesmoides*	
	Pluchea dentex	
	Pluchea ferdinandi-muelleri	
	Pluchea rubelliflora	
	Pluchea tetranthera	
	Pterocaulon serrulatum var. *velutinum*	

Family	Species	Status
	Pterocaulon sphacelatum	
	**Sigesbeckia orientalis*	Weed
	**Sonchus oleraceus*	Weed
	Streptoglossa bubakii	
	Streptoglossa decurrens	
	Streptoglossa liatroides	
	Streptoglossa sp. (inadequate material)	
Boraginaceae	*Ehretia saligna var. saligna*	
	Heliotropium chrysocarpum	
	Heliotropium conocarpum	
	Heliotropium cunninghamii	
	Heliotropium heteranthum	
	Heliotropium inexplicitum	
	Heliotropium ovalifolium	
	Heliotropium pachyphyllum	
	Heliotropium skeleton	
	Heliotropium tanythrix	
	Heliotropium tenuifolium	
	Heliotropium sp. (inadequate material)	
	Trichodesma zeylanicum var. *zeylanicum*	
Brassicaceae	*Lepidium pedicellosum*	
	Lepidium phlebopetalum	
	Lepidium sp. (inadequate material)	
Capparaceae	*Capparis lasiantha*	
	Capparis spinosa subsp. *nummularia*	
	Capparis umbonata	
Caryophyllaceae	*Polycarpaea corymbosa* var. *corymbosa*	
	Polycarpaea holtzei	
	Polycarpaea longiflora	
Celastraceae	*Stackhousia muricata* subsp. annual (W.R. Barker 2172)	
Chenopodiaceae	*Atriplex codonocarpa*	
	Dysphania plantaginella	
	Dysphania rhadinostachya	
	Dysphania rhadinostachya subsp. *rhadinostachya*	
	Dysphania sphaerosperma	
	Dysphania sp. (inadequate material)	
	Maireana carnosa	
	Maireana ? eriosphaera	
	Maireana georgei	
	Maireana melanocoma	
	Maireana planifolia	
	Maireana villosa	
	Rhagodia eremaea	
	Rhagodia sp. Hamersley (M. Trudgen 17794)	Priority 3
	Salsola australis	
	Sclerolaena cornishiana	
	Sclerolaena costata	
	Sclerolaena cuneata	
	Sclerolaena densiflora	
	Sclerolaena eriacantha	
	Sclerolaena hostilis	

Family	Species	Status
	Sclerolaena lanicuspis	
Cleomaceae	*Arivela viscosa*	
Commelinaceae	*Commelina ensifolia*	
Convolvulaceae	*Bonamia erecta*	
	Bonamia media	
	Bonamia pannosa	
	Bonamia pilbarensis	
	Convolvulus clementii	
	Duperreya commixta	
	Evolvulus alsinoides	
	Evolvulus alsinoides var. *decumbens*	
	Evolvulus alsinoides var. *villosicalyx*	
	Ipomoea coptica	
	Ipomoea muelleri	
	Ipomoea plebeia	
	Ipomoea polymorpha	
	Ipomoea racemigera	Priority 2
	Operculina aequisepala	
	Polymeria ambigua	
	Polymeria mollis	
	Polymeria sp. (inadequate material)	
Cucurbitaceae	*Austrobryonia pilbarensis*	
	**Citrullus colocynthis*	Weed
	Cucumis melo	
	Cucumis picrocarpus	
	Cucumis variabilis	
Cyperaceae	*Bulbostylis barbata*	
	Bulbostylis turbinata	
	Cyperus bifax	
	Cyperus bulbosus	
	Cyperus difformis	
	Cyperus hesperius	
	Cyperus iria	
	Cyperus ixiocarpus	
	Cyperus nervulosus	
	Cyperus pulchellus	
	Cyperus squarrosus	
	Cyperus vaginatus	
	Eleocharis atropurpurea	
	Fimbristylis depauperata	
	Fimbristylis dichotoma	
	Fimbristylis elegans	
	Fimbristylis littoralis	
	Fimbristylis microcarya	
	Fimbristylis simulans	
	Fuirena ciliaris	
	Lipocarpha microcephala	
	Schoenoplectiella dissachantha	
	Schoenoplectiella laevis	
	Schoenoplectus subulatus	
Droseraceae	*Drosera finlaysoniana*	

Family	Species	Status
Elatinaceae	*Bergia ammannioides*	
	Bergia pedicellaris	
	Bergia trimera	
Euphorbiaceae	*Euphorbia australis* var. *subtomentosa*	
	Euphorbia biconvexa	
	Euphorbia boophthona	
	Euphorbia careyi	
	Euphorbia coghlanii	
	**Euphorbia hirta*	Weed
	Euphorbia inappendiculata var. *inappendiculata*	Priority 2
	Euphorbia sp. (*biconvexa/coghlanii/trigonosperma* ; sterile)	
	Euphorbia tannensis subsp. *eremophila*	
	Euphorbia trigonosperma	
	Euphorbia vaccaria var. *erucoides*	
	Euphorbia vaccaria var. *vaccaria*	
Fabaceae	*Acacia acradenia*	
	Acacia acradenia x (indeterminate hybrid)	
	Acacia adoxa var. adoxa	
	Acacia ampliceps	
	Acacia ancistrocarpa	
	Acacia aphanoclada	Priority 1
	Acacia aphanoclada x *A. pyrifolia* var. *pyrifolia*	
	Acacia aptaneura	
	Acacia ayersiana	
	Acacia ayersiana (narrow phyllode variant)	
	Acacia bivenosa	
	Acacia colei	
	Acacia coriacea subsp. *pendens*	
	Acacia cyperophylla var. *omearana*	Priority 1
	Acacia eriopoda	
	Acacia eriopoda x *A. trachycarpa*	
	Acacia hilliana	
	Acacia inaequilatera	
	Acacia kempeana	
	Acacia maitlandii	
	Acacia marramamba	
	Acacia monticola	
	Acacia orthocarpa	
	Acacia orthocarpa (wispy form)	
	Acacia pruinocarpa	
	Acacia ptychophylla	
	Acacia pyrifolia var. *pyrifolia*	
	Acacia retivenea subsp. *clandestina*	
	Acacia sclerosperma subsp. *sclerosperma*	
	Acacia spondylophylla	
	Acacia synchronicia	
	Acacia tetragonophylla	
	Acacia trachycarpa	
	Acacia trachycarpa x *A. tumida* var. *pilbarensis*	
	Acacia tumida var. *pilbarensis*	
	Aeschynomene indica	

Family	Species	Status
	Alysicarpus muelleri	
	Cajanus cinereus	
	Crotalaria cunninghamii subsp. *sturtii*	
	Crotalaria dissitiflora subsp. *benthamiana*	
	Crotalaria medicaginea var. *neglecta*	
	Cullen graveolens	
	Cullen leucanthum	
	Cullen pogonocarpum	
	Cullen stipulaceum	
	Desmodium campylocaulon	
	Desmodium muelleri	
	Dichrostachys spicata	
	Erythrina vespertilio	
	Gastrolobium grandiflorum	
	Glycine canescens	
	Indigastrum parviflorum	
	Indigofera colutea	
	Indigofera hirsuta	
	**Indigofera hochstetteri*	Weed
	Indigofera linifolia	
	Indigofera linnaei	
	Indigofera monophylla	
	Indigofera rugosa	
	Indigofera trita subsp. *trita*	
	Isotropis atropurpurea	
	**Leucaena leucocephala*	Weed
	Neptunia dimorphantha	
	Petalostylis labicheoides	
	Rhynchosia minima	
	Senna artemisioides subsp. *helmsii*	
	Senna artemisioides subsp. *oligophylla*	
	Senna artemisioides subsp. *oligophylla* x *S. symonii*	
	Senna artemisioides subsp. *oligophylla* x subsp. *helmsii*	
	Senna glutinosa subsp. *? chatelainiana* x subsp. *glutinosa*	
	Senna glutinosa subsp. *glutinosa*	
	Senna glutinosa subsp. *glutinosa* x	
	Senna glutinosa subsp. *glutinosa* x subsp. x *luerssenii*	
	Senna glutinosa subsp. *pruinosa*	
	Senna glutinosa subsp. x *luerssenii*	
	Senna hamersleyensis x *S.* sp. Karijini (M.E. Trudgen 10392)	
	Senna notabilis	
	Senna symonii	
	Senna venusta	
	Sesbania cannabina	
	**Stylosanthes hamata*	Weed
	Swainsona decurrens	
	Swainsona stenodonta	
	Swainsona thompsoniana	Priority 3
	Tephrosia clementii	
	Tephrosia densa	
	Tephrosia rosea var. *clementii*	

Family	Species	Status
	Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)	
	Tephrosia supina	
	Tephrosia virens	
	Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	
	Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)	
	Tephrosia sp. Newman (A.A. Mitchell PRP 29)	
	Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	
	**Vachellia farnesiana*	Weed
	Vigna lanceolata var. lanceolata	
	Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)	
Frankeniaceae	*Frankenia* sp. (inadequate material)	
Goodeniaceae	*Dampiera candicans*	
	Goodenia cusackiana	
	Goodenia forrestii	
	Goodenia lamprosperma	
	Goodenia microptera	
	Goodenia muelleriana	
	Goodenia nuda	Priority 4
	Goodenia stobbsiana	
	Goodenia triodiophila	
	Scaevola amblyanthera var. *centralis*	
	Scaevola browniana subsp. *browniana*	
	Scaevola spinescens	
Haloragaceae	*Gonocarpus ephemerus*	
	Haloragis gossei var. *gossei*	
Lamiaceae	*Basilicum polystachyon*	
	Clerodendrum floribundum var. *angustifolium*	
	Newcastelia sp. Hamersley Range (S. van Leeuwen 4264)	
Lauraceae	*Cassytha capillaris*	
	Cassytha filiformis	
Loranthaceae	*Amyema preissii*	
	Diplatia grandibractea	
Lythraceae	*Ammannia baccifera*	
	Ammannia multiflora	
	Rotala diandra	
Malvaceae	*Abutilon cunninghamii*	
	Abutilon fraseri subsp. *fraseri*	
	Abutilon lepidum	
	Abutilon macrum	
	Abutilon malvifolium	
	Abutilon otocarpum	
	Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	
	Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	
	Abutilon sp. Pilbara (W.R. Barker 2025)	
	Abutilon sp. (inadequate material)	
	Androcalva luteiflora	
	Corchorus incanus subsp. *incanus*	
	Corchorus lasiocarpus (sterile)	
	Corchorus lasiocarpus subsp. *lasiocarpus*	
	Corchorus parviflorus	
	Corchorus tridens	

Family	Species	Status
	Corchorus sp. (inadequate material)	
	Gossypium australe	
	Gossypium robinsonii	
	Hibiscus austrinus var. *austrinus*	
	Hibiscus brachysiphonius	
	Hibiscus burtonii	
	Hibiscus coatesii	
	Hibiscus goldsworthii	
	Hibiscus sturtii var. *campylochlamys*	
	Hibiscus sturtii var. *grandiflorus*	
	Hibiscus sturtii var. *platychlamys*	
	**Malvastrum americanum*	Weed
	Melhania oblongifolia	
	Sida arsiniata	
	Sida clementii	
	Sida echinocarpa	
	Sida fibulifera	
	Sida rohlenae subsp. *rohlenae*	
	Sida sp. L (A.M. Ashby 4202)	
	Sida sp. Pilbara (A.A. Mitchell PRP 1543)	
	Sida aff. sp. Pilbara (A.A. Mitchell PRP 1543)	
	Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	
	Sida sp. (inadequate material)	
	Triumfetta appendiculata	
	Triumfetta chaetocarpa	
	Triumfetta clementii	
	Triumfetta maconochieana	
	Triumfetta sp. (inadequate material)	
	Waltheria indica	
Marsileaceae	*Marsilea hirsuta*	
Meliaceae	**Azadirachta indica*	Weed
Menispermaceae	*Tinospora smilacina*	
Molluginaceae	*Trigastrotheca molluginea*	
Moraceae	*Ficus brachypoda*	
Myrtaceae	*Calytrix carinata*	
	Corymbia flavescens	
	Corymbia hamersleyana	
	Eucalyptus camaldulensis subsp. *refulgens*	
	Eucalyptus leucophloia subsp. *leucophloia*	
	Eucalyptus socialis subsp. *eucentrica*	
	Eucalyptus victrix	
	Melaleuca argentea	
	Melaleuca bracteata	
	Melaleuca eleuterostachya	
	Melaleuca glomerata	
	Melaleuca linophylla	
Nyctaginaceae	*Boerhavia burbidgeana*	
	Boerhavia coccinea	
	Boerhavia gardneri	
	Boerhavia paludosa	
	Boerhavia sp. (inadequate material)	

Family	Species	Status
Oleaceae	*Jasminum didymum subsp. lineare*	
Onagraceae	*Ludwigia perennis*	
Passifloraceae	**Passiflora foetida* var. *hispida*	Weed
Phrymaceae	*Peplidium* sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)	
Phyllanthaceae	*Flueggea virosa* subsp. *melanthesoides*	
	Notoleptopus decaisnei	
	Phyllanthus erwinii	
	Phyllanthus exilis	
	Phyllanthus maderaspatensis	
Plantaginaceae	*Stemodia grossa*	
	Stemodia viscosa	
Plumbaginaceae	*Plumbago zeylanica*	
Poaceae	*Aristida burbidgeae*	
	Aristida contorta	
	Aristida holathera var. holathera	
	Aristida latifolia	
	Aristida pruinosa	
	Bothriochloa ewartiana	
	**Cenchrus ciliaris*	Weed
	**Cenchrus setiger*	Weed
	Chloris pectinata	
	Chloris pumilio	
	Chrysopogon fallax	
	Cymbopogon ambiguus	
	Cymbopogon obtectus	
	Cymbopogon sp. (inadequate material)	
	Cynodon convergens	
	**Cynodon dactylon*	Weed
	Cynodon prostratus	
	Dactyloctenium radulans	
	Dichanthium sericeum subsp. humilius	
	Digitaria ctenantha	
	Diplachne fusca subsp. fusca	
	**Echinochloa colona*	Weed
	Elytrophorus spicatus	
	Enneapogon caerulescens	
	Enneapogon cylindricus	
	Enneapogon lindleyanus	
	Enneapogon polyphyllus	
	Enneapogon robustissimus	
	Enteropogon ramosus	
	**Eragrostis cilianensis*	Weed
	Eragrostis crateriformis	Priority 3
	Eragrostis cumingii	
	Eragrostis desertorum	
	Eragrostis dielsii	
	Eragrostis eriopoda	
	Eragrostis exigua	
	Eragrostis falcata	
	Eragrostis leptocarpa	
	Eragrostis olida	

Family	Species	Status
	Eragrostis tenellula	
	Eragrostis xerophila	
	Eriachne benthamii	
	Eriachne flaccida	
	Eriachne lanata	
	Eriachne mucronata (typical form)	
	Eriachne pulchella	
	Eriachne tenuiculmis	
	Eulalia aurea	
	Iseilema dolichotrichum	
	Iseilema vaginiflorum	
	Panicum decompositum	
	Panicum laevinode	
	Paraneurachne muelleri	
	Paspalidium clementii	
	Paspalidium rarum	
	Paspalidium retiglume	Priority 2
	Perotis rara	
	**Setaria verticillata*	Weed
	Sorghum plumosum var. *plumosum*	
	Sporobolus actinocladus	
	Sporobolus australasicus	
	Themeda triandra	
	Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Priority 3
	Themeda ? sp. Hamersley Station (M.E. Trudgen 11431)	Priority 3?
	Tragus australianus	
	Triodia basedowii	
	Triodia brizoides	
	Triodia epactia	
	Triodia longiceps	
	Triodia vanleeuwenii	
	Triodia wiseana	
	Tripogonella loliiformis	
	Triraphis mollis	
	Urochloa subquadripara	
	Yakirra australiensis var. australiensis	
Polygalaceae	*Polygala glaucifolia*	
Portulacaceae	*Calandrinia stagnensis*	
	Calandrinia tepperiana	
	Calandrinia sp. (inadequate material)	
	Portulaca cyclophylla	
	Portulaca filifolia	
	Portulaca intraterranea	
	Portulaca oleracea/intraterranea (taxonomy inadequate to determine with confidence)	
Potamogetonaceae	*Potamogeton tricarinatus*	
Proteaceae	*Grevillea berryana*	
	Grevillea pyramidalis subsp. *leucadendron*	
	Grevillea wickhamii subsp. *hispidula*	
	Hakea chordophylla	
	Hakea lorea subsp. *lorea*	

Family	Species	Status
Rhamnaceae	*Ventilago viminalis*	
Rubiaceae	*Oldenlandia crouchiana*	
	Oldenlandia galioides	
	Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	Priority 3
	Psydrax latifolia	
	Synaptantha tillaeacea var. *tillaeacea*	
Santalaceae	*Santalum lanceolatum*	
Sapindaceae	*Atalaya hemiglauca*	
	Dodonaea coriacea	
	Dodonaea lanceolata var. lanceolata	
Scrophulariaceae	*Eremophila forrestii subsp. forrestii*	
	Eremophila latrobei subsp. latrobei	
	Eremophila longifolia	
Solanaceae	*Nicotiana umbratica*	Priority 3
	**Physalis angulata*	Weed
	Solanum cleistogamum	
	Solanum diversiflorum	
	Solanum elatius	
	Solanum horridum	
	Solanum ? horridum (inadequate material)	
	Solanum lasiophyllum	
	**Solanum nigrum*	Weed
	Solanum phlomoides	
	Solanum sp. Mosquito Creek (A.A. Mitchell et al. AAM 10795)	Priority 1
	Solanum sp. (inadequate material)	
Tamaricaceae	**Tamarix aphylla* (in contextual area only)	Weed
Typhaceae	*Typha domingensis*	
Violaceae	*Hybanthus aurantiacus*	
Zygophyllaceae	*Tribulus hirsutus*	
	Tribulus platypterus	
	Tribulus suberosus	
	**Tribulus terrestris*	Weed
	Tribulus sp. long-styled eichlerianus (A.S. George 10666)	
	Tribulus sp. (inadequate material)	
Characeae	*Chara* sp.	Algae

Appendix 15

Selected Inputs and Outputs of the Floristic Analyses

Site	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
VegType	H5	P1	H1	H1	H1	H4	H4	H5	H3	P4	H5	P4	H6	H2	P3	H5	H6	D3
Landform	Hill	Saline plain	Hill	Hill	Hill	Hill	Hill	Hill	Hill	Gravelly plain	Hill	Gravelly plain	Hill	Hill	Gravelly plain	Hill	Hill	Major creek
FGcover	w	n	u	r	u	x	x	w	v	ae	w	ae	aa	u	ab	w	z	d
FG25% sim	f	d	e	e	e	f	f	f	f	g	f	g	f	e	f	f	f	a

Abutil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuoxy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuspD	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
AbuspP	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
acaacr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaado	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaamp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaphP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acabiv	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	2	0.1	0.1	0	0	0.1	0.1	0	0
acacol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
acacor	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	1
acaeri	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	2	0	0
acahil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaina	0	0	0	0.1	0.1	0.1	0	0	3	0	0	0	1	1	0	0	1	0
acaort	15	0	0	0	0.1	0.1	0.1	7	0	0	3	0	0	0	0	13	0	0
acapru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapty	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
acapyr	0.1	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0.1	0	0	0	0
acasyn	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	5	0	0	0.1
acatet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatra	0	0	0.1	0.1	0	0	0	0.1	0	6	0	1	0	0	0	0	0	2
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
achasp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aesind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
altnan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
alymue	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0
amacus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
amaund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1
ammbac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ammmul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aricon	0.1	0.1	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0.1	0.1	0	0
arihol	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0
arilat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arivis	0.1	0	0.1	0	0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1
atahem	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
berped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
boebur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
boecoc	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
boegar	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0
boepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonere	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
bonpan	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
bonpil	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0	0	0	0	0
botewa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bulbar	0.1	0	0.1	0	0	0.1	0	0	0	0.1	0.1	0.1	0	0.1	0.1	0.1	0	0.1
bultur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
cajcin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
caltep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
carlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
cascap	0	0.1	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0
cencsp	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0	0
cenmin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
chlpec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chlpum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chrfal	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
cleflo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
concle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corinc	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0
corpar	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
corpar	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	1	0.1	0	0.1	0.1	0.1
cortri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
corham	0	0	0	0.5	0.1	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0
crocun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
cucmel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucpic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucvar	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0.1
culleu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
culpog	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cymamb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
cymobt	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0
cyncon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cynpro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
cypdif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypiri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
cypixi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypsqu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypvag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
dacrad	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0.1
damcan	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
descam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
desmue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dicser	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0
digcte	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
dipfus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dupcom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dyspla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dysrha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0
enncae	0	0	0.1	0.1	0.1	0	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennlin	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
ennpol	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eracra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eracum	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0.1
erades	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
eradie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
eralep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
eraten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
erefor	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0
erelon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eriben	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
eripul	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eriten	0.1	0.1	0	0	0.1	0	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0.1	0	0
eriten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
eryves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euccam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucleu	0	0	0	0	0	0.1	0	0	0	0	0.5	0	0	0	0	0	0	0
eucsoc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucvic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
eulaur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
eupaus	0	0	0.1	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eupaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
eupboo	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0

Site	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
eupcar	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
eupina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptri	0.1	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1
eupvacE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupvacV	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0
evoals	0	0	0.1	0.1	0	0	0	0	0	0.1	0	0.1	0.1	0	0.1	0.1	0	0.1
fimdep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimdic	0	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0	0.1	1	0.1	0	0
fimmic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimsim	0	0	0	0	0	0.1	0.5	0	0.1	0	0	0	0	0	0	0	0	0
fluvir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
glycan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomaff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
gomcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomkan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goocus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goofor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goolam	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
goomic	0	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0	0.1	0	0	0	0.1	0	0
goomue	0	0.1	0.1	0	0.1	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0
goonud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goosto	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
gosaus	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0	0.1	0	0.1	1	0
gosrob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grepyr	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
grewic	0.1	0	0	0	0	0.1	0.1	0	0.1	0	0.1	0	0	0	0	0	0.1	0
hakcho	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
haklor	0	0.1	0.1	0	0	0	0.1	0.1	0	0.1	0	0	0	0.1	0	0	0	0
halgos	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
helchr	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helhet	0	0	0.1	0.1	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0.1	0	0.1
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helpac	0	0	0.1	0	0	0.1	0	0	0.1	0	0	0.1	0	0	0	0	0	0
helske	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibcoa	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
hibstuC	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0.1
hibstuG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
hybaur	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1
indpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcol	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
indlin	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indlin	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
indmon	9	0.1	0	0.1	0	0.1	0	0.1	0.1	0.1	0	0.1	0.1	0	0	0.1	0.1	0.1
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
indcop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
ipomue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
ipople	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipopol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
iporac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
isedol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
isoatr	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0
ludper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maieri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maicar	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maigeo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maimel	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
marhir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
melele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melglo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
mellin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melobl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0

Site	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
nepdim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
notdec	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0
oldcro	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
oldspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pandec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
parmue	0	0	0	0.1	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0
pascle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pasrar	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0.1
pepspE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
perrar	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
petlab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
phymad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
pluden	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0.1
plufer	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
plurub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
plutet	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0.1	0	0	0	0	0	0
polcor	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0
polhol	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
polgla	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0
polamb	0	0	0	0	0.1	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0.1
portole	0	0	0.1	0	0.1	0	0.1	0	0.1	0.1	0	0	0	0	0.1	0	0	0.1
ptesph	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
ptiaer	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiast	0	0.1	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0
ptiaur	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0
ptiaxi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptical	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0
pticle	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiexa	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0
ptifus	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ptigom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiobo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rhymin	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0
rosads	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
salaus	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
sanlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
scaamb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
schsub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcos	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
sclcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclden	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
sclhos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartH	0	0	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0.1	0.1	0	0	0
SenartO	0.1	0	0.1	0.1	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0
senartOS	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
senartOH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluG	0.1	0	0	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0.1	0.1	0	0.1	0.1	0
sengluGL	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluP	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0
sengluL	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
senham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sennot	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0
sensym	0	0.1	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0
sescan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
sidaffP	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0
sidech	0	0	0.1	0.1	0.1	0	0	0	1	0	0	0	0.1	0.1	0.1	0	0	0
sidfib	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
sidroh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspP	0.1	0	0	0	0	0.1	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0

Site	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
sidspS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
soldiv	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1
solhor	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sollas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solphl	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
solspM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
spoact	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
spoaus	0	0.1	0.1	0	0.1	0.1	0.1	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0	0.1
stamur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
stegro	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0.1
strbub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
strdec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
strlia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
swaste	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
syntil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepden	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
teprosC	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
tepspBC	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
tepspCS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspNW	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thetri	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tinsmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
traole	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tritri	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
trihir	0	0	0	0	0.1	0.1	0	0	0	0.1	0.1	0	0	0	0	0	0	0
tripla	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trispLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trisub	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
trizey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
trimol	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0
tribri	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	0
triepa	40	0	0	0	0	20	45	45	25	30	30	3	31	0	30	21	35	0
trilon	0	35	0	0	0	0	0	0	0	11	0	35	0	0	0.1	0	0	7
trivan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triwis	0	0	22.5	40	40	0	0	0	25	0	0	0	0.5	29	0.1	0	0	0
trilol	0	0	0.1	0	0	0	0.1	0.1	0	0	0.1	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triapp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
viglan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
vigspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
yakaus	0.1	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0	0	0	0.1	0	0
zalgal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36
VegType	H4	H4	H1	P4	H6	H6	H6	H5	H8	H8	H6	D2	P1	P4	H8	P4	D5	P1
Landform	Hill	Hill	Hill	Gravelly plain	Hill	Hill	Hill	Hill	Hill	Hill	Hill	Major creek	Saline plain	Gravelly plain	Hill	Gravelly plain	Minor creek	Saline plain
FGcover	x	x	r	ae	z	z	aa	w	k	k	z	d	n	ae	k	aa	ad	n
FG25% sim	f	f	e	g	f	f	f	f	b	b	f	a	d	g	b	f	g	d

Abutil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumac	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
abumal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuoxy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuspD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AbuspP	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaacr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
acaado	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaamp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaph	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	0	0.1	0	0	0
acaaphP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acabiv	0.1	0.1	8	0	0	0	0	0.1	12	1	0	0	1.5	0	0	0.1	0.1	0
acacol	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
acacor	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
acaeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
acahil	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
acaina	0	0	0.1	0.1	0.5	0.5	0.5	0	0.1	0	0.1	0	0	0.1	0	0.5	0	0
acaort	0	0	0	0	0	0	0	11	0.5	0	0	0	0	0	0	0	0	0
acapru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapty	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapyr	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acasyn	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0	0	0
acatet	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
acatra	0.5	0	0	0.5	0	0	0	0	0	0	0	10	0	0.1	0	3	5	0
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
achasp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aesind	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
altang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altnan	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
alymue	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0
amacus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
amaund	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ammbac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ammmul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aricon	0.1	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0
arihol	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
arilat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arivis	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0.1	0	0.1	0	0	0	0
atahem	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
berped	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
boebur	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
boecoc	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0.1	0	0.1	0	0
boegar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonere	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
bonpan	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpil	0	0.1	0	0	0.1	0.1	0.1	0	0	0	0.1	0	0	0	0	0.1	0	0
botewa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bulbar	0	0.1	0	0.1	0	0	0.1	0	0.1	0.1	0	0.1	0	0.1	0	0	0.1	0
bultur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cajcin	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
caltep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
carlan	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
cascap	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cencsp	0	0	0.1	0.1	0	0	0	0	0	0	0	0.2	0	0.1	0	0.1	0.2	0
cenmin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36
chlpec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chlpum	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
chrfal	0	0.1	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	5	0
cleflo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
concle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corinc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0.1	0.1	0.1	15	0.1	0.5	0.1	0.1	0	0	0	0.1	0.1	0.1	0	0.1	0.1	0
cortri	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
corham	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
crocun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucmel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucpic	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cucvar	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0
culleu	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
culpog	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0
cymamb	0	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0	0	0	0	0.1	0
cymobt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cyncon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cynpro	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypdif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypiri	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cypixi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypsqu	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cypvag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dacrad	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1
damcan	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
descam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
desmue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dicser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
digcte	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipfus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dupcom	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
dyspla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dysrha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
enncae	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennpol	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
eracra	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
eracum	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0.1	0.1	0
erades	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eradie	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
eralep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
eraten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erefor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erelon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eriben	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eripul	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eriten	0.1	0.1	0	0.1	0	0	0.1	0	0	0.1	0	0	0	0	0	0.1	0	0
eriten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eryves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euccam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucleu	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0.5	0
eucsoc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucvic	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0
eulaur	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
eupaus	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
eupaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupboo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36
eupcar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptri	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
eupvacE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupvacV	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
evoals	0	0	0.1	0.1	0	0	0.1	0	0	0	0	0.1	0	0.1	0	0	0.1	0
fimdep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
fimdic	0.1	0.1	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0.1
fimmic	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
fimsim	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
fluvir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
glycan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomaff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcun	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0.1	0	0	0	0
gomkan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goocus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
goofor	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goolam	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0
goomic	0.1	0.1	0.1	8	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0
goomue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goonud	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
goosto	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
gosaus	0.1	0	0	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0	0	0	0	0	0
gosrob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grepyr	0	0	0	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0
grewic	0.1	0	0	0	0.1	0.1	0.1	0	0	0.1	0.1	0	0.1	0	0	0	0.1	0
hakcho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
haklor	0	0.1	0.1	0	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0
halgos	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helchr	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helhet	0	0	0.1	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helpac	0.1	0.1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helske	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibcoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuC	0.1	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
hibstuG	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hybaur	0	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0
indpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcol	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0
indlin	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
indlin	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
indmon	1	0	0	0.1	1	0.1	0.1	0	0	0.1	0.1	0.1	0	0	0	0.1	0.1	0
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipomue	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ipople	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipopol	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
iporac	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
isedol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
isoatr	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ludper	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
maieri	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
maicar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
maigeo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maimel	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0	0	0
marhir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
melglo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
mellin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melobl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36
nepdim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
notdec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
oldcro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
oldspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pandec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
parmue	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0
pascle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pasrar	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0
pepspE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
perrar	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
petlab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phymad	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
pluden	0.1	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0
plufer	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
plurub	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0
plutet	0.1	0	0	0.1	0	0	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0	0.1
polcor	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
polhol	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
polgla	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
polamb	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
portole	0.1	0	0	0.1	0	0	0.1	0	0	0	0	0.1	0	0.1	0	0.1	0	0
ptesph	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
ptiaer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiast	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
ptiaur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiaxi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptical	0.1	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
pticle	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
ptiexa	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
ptifus	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
ptigom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiobo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rhymin	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0
rosads	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
salaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
sanlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
scaamb	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schsub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcos	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0
sclcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
sclden	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1
sclhos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
senartH	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0.1	0	0
SenartO	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartOS	0	0	0.1	0	0	0	0	0	0.1	0.5	0.1	0	0	0	0	0	0	0
senartOH	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluG	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0
sengluGL	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluP	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
sengluL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
senham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sennot	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sensym	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0.1	0
sescan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
sidaffP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
sidech	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
sidfib	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
sidroh	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
sidspP	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36
sidspS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
soldiv	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
solhor	0	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
sollas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solphl	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solspM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
spoact	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
spoaus	0.1	0	0	0.1	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0.1	0.1	0.1
stamur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
stegro	0	0	0.1	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0
strbub	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
strdec	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
strlia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
swaste	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
syntil	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspBC	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
tepspCS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspN	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspNW	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thetri	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0
tinsmi	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0
traole	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tritri	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0.1
trihir	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
tripla	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trispLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trisub	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0	0	0	0	0	0	0	0
trizey	0	0	0.1	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0
trimol	0.1	0.1	0	0.5	0	0	0.1	0	0	0.1	0	0	0	0.1	0	0	0.1	0
tribri	0	0	0	0	0.1	0	0	0	25	40	0	0	0	0	60	0	0	0
triepa	25	40	0	10	75	40	35	31	5	0	50	0.1	0	0.1	0	35	5	0
trilon	0	0	0.1	0	0	0	0	0	0	0.1	0	10	45	9	0.5	0	2	55
trivan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triwis	0	0	60	0	0	0	0	0	1	0.1	0	0	0	0	0	0	0	0
trilol	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triapp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
viglan	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
vigspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0
yakaus	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
zalgal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52
VegType	H6	P1	H6	H6	H3	P1	P1	H6	H2	C1	P4	H1	P5	P5	D4	C1
Landform	Hill	Saline plain	Hill	Hill	Hill	Saline plain	Saline plain	Hill	Hill	Clayey plain	Gravelly plain	Hill	Gravelly plain	Gravelly plain	Major creek	Clayey plain
FGcover	y	n	aa	aa	v	n	n	aa	t	l	a	s	p	p	j	l
FG25% sim	f	d	f	f	f	d	d	f	e	c	a	e	e	e	a	c
Abutil	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumal	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
abuoxy	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
abuspD	0.1	0	0.1	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0
AbuspP	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
acaacr	3	0	0	0	0.1	0	0.1	0	0.1	0	0	0	0	0	0	0
acaado	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
acaamp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
acaaph	0	0.5	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
acaaphP	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acabiv	0	1	0	0.1	0.1	0.5	0.1	0	0	0	0	0.5	0	3	0	0
acacol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acacor	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	15	0
acaeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acahil	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
acaina	0.5	0	3	3	0.1	0	0	7	0.5	0	0	0.1	0	0	0	1
acaort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapyr	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	1
acasyn	0	0.1	0	0	0	0.1	0	0	0	3	0	0.3	0	0	0	0
acatet	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
acatra	0	0	0	0	0	0	0.1	0	0	0	1	0	0	0	0	0
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
achasp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aesind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
altang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
altnan	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
alymue	0	0	0.1	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0	0.1	0
amacus	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
amaund	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0
ammbac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ammmul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
aricon	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
arihol	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
arilat	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
arivis	0.1	0	0	0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
atahem	0.1	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	2	0
berped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boebur	0	0	0.1	0	0	0	0	0.1	0	0	2	0	0	0	0	0
boecoc	0.1	0	0	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1	0
boegar	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
boepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonere	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpil	0	0	0.1	0.1	0.1	0	0	0.1	0	0	0	0.1	0	0	0	0.1
botewa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bulbar	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0
bultur	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cajcin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
caltep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
carlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cascap	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0
cencsp	0.2	0	2	0.2	0	0	0.1	0.1	0.1	0.2	4.1	0.1	0.1	0.1	20.1	0.2
cenmin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0

Site	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52
chlpec	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
chlpum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chrfal	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0.1	0	0
cleflo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
concle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corinc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
corpar	0.1	0.1	2	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0	0	0.1	0.1
cortri	0	0	0.1	0.1	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
corham	0	0	1	0	0	0	0.1	0	0	0	7	0	0	0	0	1
crocun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0.1	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1
cucmel	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
cucpic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
cucvar	0	0.1	0.1	0	0	0	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
culleu	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
culpog	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cymamb	0.1	0	0.1	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0
cymobt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cyncon	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0
cynpro	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypdif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
cypiri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
cypixi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
cypsqu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
cypvag	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0.1	0
dacrad	0	0	0	0.1	0	0.1	0	0	0	0.1	0.1	0.1	0.1	0	0.1	0
damcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
descam	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
desmue	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
dicser	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1
digcte	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipfus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dupcom	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
dyspla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dysrha	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
enncae	0	0.1	0	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0.1
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
ennlin	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennpol	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0
eracra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
eracum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
erades	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
eradie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eralep	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
eraten	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
erefor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erelon	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0.1	0	0
eriben	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eripul	0	0	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0.1
eriten	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
eriten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eryves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euccam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucleu	0	0.5	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0
eucsoc	0	0	0	0	0	0	0	0	0	0	0	0	4	7	0	0
eucvic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
eulaur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
eupaus	0	0	0.1	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0.1	0.1
eupaus	0	0.1	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0
eupboo	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0

Site	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52
eupcar	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
eupina	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
euptan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptri	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0.1
eupvacE	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
eupvacV	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
evoals	0.1	0	0.1	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.1
fimdep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
fimdic	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0
fimmic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimsim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fluvir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
glycan	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
gomaff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcun	0.1	0	0.1	0.1	0	0	0	0.1	0.1	0	0	0.1	0	0	0	0
gomkan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goocus	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
goofor	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0
goolam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
goomic	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0.1
goomue	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0	0.1
goonud	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
goosto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gosaus	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0	0	0	0	0	0
gosrob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grepyr	0	0	2	0	0	0	0	0.1	0	0	0	0	0	0	0	0
grewic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hakcho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
haklor	0	0	0	1	0	0	0	0	0	0	0.1	0.1	0	0	0	0
halgos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helchr	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helpac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helske	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
hibcoa	0.1	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0	0.1	0	0
hibstuC	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
hibstuG	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
hybaur	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0
indpar	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0
indcol	0	0	0.1	0.1	0	0	0	0.1	0	0	0.1	0	0	0	0	0
indlin	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1
indlin	0	0	0	0	0	0	0	0	0	0	3	0	0.1	0	0	0
indmon	2	0	0.1	0	0.1	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcop	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	1
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipomue	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
ipople	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipopol	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	1
iporac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
isedol	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0.1
isoatr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ludper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
maieri	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
maicar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maigeo	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
maimel	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
marhir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
melele	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
melglo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
mellin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
melobl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52
nepdim	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0.1
notdec	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0.1	0.1	0.1	0.1
oldcro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
oldspH	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
pandec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
parmue	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
pascle	0.1	0	0.1	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0	0	0
pasrar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pepspE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
perrar	0	0	0.1	0.1	0	0	0	0	0	0	0.1	0	0.1	0	0	0
petlab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phymad	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0.1	0.1
pluden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
plufer	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0.1	0	0
plurub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
plutet	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
polcor	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0
polhol	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0
polgla	0	0	0.1	0.1	0.1	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0.1
polamb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
portole	0	0	0.1	0.1	0	0.1	0	0.1	0	0.1	0.1	0.1	0	0	0.1	0.1
ptesph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
ptiaer	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
ptiast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiaur	0	0	0	0.1	0	0	0	0.1	0	0	0.1	0.1	0	0	0	0
ptiaxi	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
ptical	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pticle	0.1	0.1	0.1	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0	0
ptiexa	0	0.1	0	0	0.1	0	0.1	0	0	0	0	0	0.1	0.1	0	0
ptifus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptigom	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiobo	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rhymin	0.1	0	0.1	0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0.1
rosads	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
salaus	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sanlan	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
scaamb	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schsub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0
sclcos	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0	0.1
sclcun	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
sclden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclhos	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
senartH	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
SenartO	0.1	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0
senartOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartOH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluG	0	0	0.1	0	0.1	0	0	0.1	0.1	0	0	0	0.1	0	0	0
sengluGL	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1	0	0	0
sengluP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluL	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
senham	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0
sennot	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0
sensym	0	0.1	0	0	0.1	0.1	0.1	0	0	0	0	0	0.1	0.1	0	0
sescan	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
sidaffP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidech	0	0	0.1	0.1	0	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0	0
sidfib	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1
sidroh	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspP	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0

Site	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52
sidspS	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
soldiv	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
solhor	0	0	0.1	0	0	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0
sollas	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0
solphl	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
solspM	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
spoact	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
spoaus	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	9	0.1	0.1	0.1	0.1	0.1	0.1
stamur	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
stegro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1
strbub	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0
strdec	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0.1	0	0
strlia	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
swaste	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0
syntil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
tepden	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
teprosC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspBC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspCS	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
tepspN	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
tepspNW	0	0	0.1	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
thetri	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0
tinsmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traole	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
traaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tritri	0.1	0.1	0	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0	0	0	0
trihir	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0
tripla	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
trispLS	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
trisub	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trizey	0.1	0	0.1	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tribri	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triepa	28	0	27	23	30	0	0	60	0	10	0.1	0	0	0	0	10
trilon	0	26	0	0.1	0	70	55	0	0	10	0.1	0.1	7	2.5	0.1	25
trivan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triwis	0	0	0	0	5	0	0	0	40	0	0	40	15	40	0	0
trilol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triapp	1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
viglan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
vigspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
yakaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
zalgal	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0

Site	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69
VegType	H2	D4	C1	H6	H2	P5	H2	H7	H6	D2	H1	H1	P3	P3	H7	H7	P2
Landform	Hill	Major creek	Clayey plain	Hill	Hill	Gravelly plain	Hill	Hill	Hill	Major creek	Hill	Hill	Gravelly plain	Gravelly plain	Hill	Hill	Gravelly plain
FGcover	t	i	l	aa	t	p	t	q	ac	a	s	s	ac	ac	q	q	m
FG25% sim	e	a	c	f	e	e	e	e	f	a	e	e	f	f	e	e	d

Abutil	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
abumac	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
abumal	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuoxy	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuspD	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0
AbuspP	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0
acaacr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
acaado	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaamp	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
acaaph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaphP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acabiv	0	0.1	0	0.1	0	0.1	0.1	0	0	0.1	1.5	1	0	0	0.1	0	0.1
acacol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acacor	0	2	0	0.1	0.1	0	0	0	0	0.5	0	0	0	0.1	0	0	0
acaeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acahil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaina	0.5	0	0	0.1	0.5	0	0.25	1	0.5	0	0.1	0.1	0.1	0.1	0.5	0	0
acaort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapru	0	0	0	0	0	0	0	0.25	0.1	0	0	0	0	0.1	0	0	0
acapty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapyr	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0
acasyn	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1
acatet	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
acatra	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
achasp	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aesind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altang	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altnan	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
alymue	0.1	0.1	0.1	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0	0
amacus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
amaund	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
ammbac	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ammmul	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
aricon	0.1	0	0.1	0	0	0.1	0	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0
arihol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arilat	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
arivis	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
atahem	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
berped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boebur	0	0.1	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0
boecoc	0.1	0.1	0	0.1	0	0	0	0.1	0.1	0	0.1	0	0	0	0.1	0	0.1
boegar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boepal	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
bonere	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpil	0.1	0	0	0.1	0	0	0.1	0	0.1	0	0.1	0.1	0	0.1	0	0.1	0
botewa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bulbar	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0
bultur	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
cajcin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
caltep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
carlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cascap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cencsp	0.1	70	0.1	0	0.2	0	0	0	0	2.5	0.2	0.1	0.5	0.1	0	0	0.1
cenmin	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0

Site	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69
chlpec	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chlpum	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
chrfal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cleflo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
concle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corinc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0.1	0.1	0	0.1	0.1	0.1
corpar	0	0.1	0	0.1	0.1	0	0.1	0.1	0	0	0.1	0	0	0	0	0	0
cortri	0	0.1	0.1	0	0.1	0	0	0	0.1	0.1	0.1	0	0.1	0.1	0	0	0
corham	0	0	0	0	0.1	0	0.25	0	0	0	0.25	0.1	0	0	0	0	0.1
crocun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0.1	0.1	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0
cucmel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucpic	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucvar	0.1	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0	0.1
culleu	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
culpog	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cymamb	0	0.1	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1
cymobt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cyncon	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cynpro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypdif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypiri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypixi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypsqu	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
cypvag	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dacrad	0	0.1	0.1	0.1	0.1	0	0	0	0	1	0.1	0	0.1	0.1	0	0	0
damcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
descam	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
desmue	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dicser	0.1	0	0.1	0	0	0	0	0	0.1	0	0.1	0	0.1	0.1	0	0	0.1
digcte	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
dipfus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dupcom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dyspla	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
dysrha	0	0.1	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
enncae	0.1	0	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
ennlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennpol	0.1	0.1	0	0.1	0	0	0	0.1	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0.1
eracra	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eracum	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0
erades	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0.5	0	0	0	0
eradie	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eralep	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0
eraten	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0
erefor	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
erelon	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0	0
eriben	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
eripul	0	0	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0	0.1	0
eriten	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1	0
eriten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eryves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euccam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucleu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucsoc	0	0	0	0	0	4.5	0	0	0	0	0	0	0	0	0	0	0
eucvic	0	4.5	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
eulaur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupaus	0	0.1	0	0.1	0.1	0	0.1	0	0.1	0	0.1	0.1	0	0	0	0	0.1
eupaus	0.1	0	0	0	0	0.1	0	0	0.1	3	0.1	0	0	0.1	0	0	0.1
eupboo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1

Site	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69
eupcar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupina	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptan	0	0	0	0	0.1	0.1	0	0.1	0	0.1	0.1	0	0.1	0	0	0	0
euptri	0	0.1	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eupvacE	0	0	0	0	0	0.1	0	0.1	0	0.1	0	0	0.1	0	0	0	0
eupvacV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
evoals	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1
fimdep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimdic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
fimmic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimsim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
fluvir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
glycan	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
gomaff	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcun	0.1	0	0.1	0.1	0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0
gomkan	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0.1	0	0	0.1	0.1	0
goocus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goofor	0	0	0	0.1	0	0.1	0.1	0	0	0	0	0.1	0.1	0	0	0	0
goolam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goomic	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0	0	0.1	0.1	0
goomue	0.1	0	0.1	0	0.1	0	0	0	0.1	0	0.1	0	0	0.1	0	0.1	0
goonud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goosto	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
gosaus	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
gosrob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grepyr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grewic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0
hakcho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
haklor	0	0	0	0.1	0.1	0	0.1	0.1	0	0	0	0.1	0	0.1	0	0	0.1
halgos	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
helchr	0	0	0	0	0.1	0.1	0	0	0	0	0.1	0.1	0.1	0	0	0	0
helhet	0	0	0	0.1	0	0.1	0	0	0	0	0.1	0	0.1	0.1	0	0	0
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
helpac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helske	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibcoa	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
hibstuC	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0
hibstuG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hybaur	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0.1	0	0
indpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
indcol	0.1	0.1	0.1	0	0.1	0	0	0	0.1	0.1	0	0	0.1	0.1	0	0	0
indlin	0.1	0.1	0.1	0	0	0	0	0	0.1	5	0.1	0	0.1	0.1	0	0	0
indlin	0.1	0.1	0	0	0.1	0	0	0	0	4	0	0	0.1	0.1	0	0	0
indmon	0	0	0	0.5	0.1	0.1	0.1	0.1	0	0	0.1	0	0	0	0.1	0.1	0.1
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcop	0	0.1	0.1	0.1	0	0.1	0	0	0	0.1	0	0	0.1	0	0	0	0
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipomue	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipople	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipopol	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
iporac	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
isedol	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
isoatr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ludper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maieri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maicar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maigeo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maimel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
marhir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melglo	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
mellin	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
melobl	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0

Site	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69
nepdim	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
notdec	0.1	0	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0	0	0.1	0	0.1
oldcro	0	0	0	0	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0
oldspH	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
pandec	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
parmue	0	0	0	0	0	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0	0
pascle	0	0	0	0	0.1	0	0	0.1	0	0	0.1	0.1	0	0.1	0.1	0.1	0
pasrar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pepspE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
perrar	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
petlab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phymad	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0.1
pluden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
plufer	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
plurub	0	0.1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
plutet	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
polcor	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
polhol	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0
polgla	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0
polamb	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
portole	0.1	0.1	0.1	0	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0
ptesph	0.1	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0
ptiaer	0	0	0.1	0	0	0	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0.1	0
ptiast	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1	0
ptiaur	0.1	0	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1
ptiaxi	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0
ptical	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
pticle	0	0	0	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0	0	0.1	0.1	0
ptiexa	0	0	0	0.1	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1
ptifus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptigom	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0
ptiobo	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
rhymin	0.1	0.1	0.1	0	0.1	0	0	0	0	0.1	0	0	0	0.1	0	0	0.1
rosads	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
salaus	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0
sanlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
scaamb	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schsub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0.1
sclcos	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclhos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartH	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1
SenartO	0	0	0	0.1	0.1	0.1	0	0.1	0	0	0	0.1	0	0	0	0	0.1
senartOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartOH	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
sengluC	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
sengluG	0	0	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0	0.1	0.1	0
sengluGL	0	0	0	0.1	0	0.1	0.1	0	0	0	0.1	0	0	0	0.3	0.1	0
sengluP	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.5	0.1
sengluL	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0.1	0	0	0	0.1
senham	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sennot	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0.1
sensym	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0
sescan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidaffP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidech	0.1	0	0	0.1	0.1	0	0	0	0.1	0.1	0.1	0	0	0.1	0	0	0
sidfib	0	0	1	0	0	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1
sidroh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69
sidspS	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
soldiv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solhor	0	0	0	0	0.1	0.1	0.1	0	0.1	0	0.1	0	0.1	0	0	0.1	0
sollas	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0.1	0	0
solphl	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
solspM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
spoact	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
spoaus	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	8	0.1	0.1	0.1	0.1	0.1	0.1	0.1
stamur	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1	0	0	0	0
stegro	0.1	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
strbub	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0	0.1	0
strdec	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
strlia	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
swaste	0.1	0	0	0.1	0	0	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0	0.1
syntil	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
teprosF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspBC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspCS	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
tepspN	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0
tepspNW	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
thetri	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
tinsmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traole	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0
traaus	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0
tritri	0	0.1	0.1	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0
trihir	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.5	0.1	0.1	0	0.1	0.1
tripla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trispLS	0	0.1	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0
trisub	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0
trizey	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0.1
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tribri	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
triepa	0.1	0	0	35	0.1	0	0	0	30	5	0	0	35	40	0	0	0
trilon	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	10	0	0.75	0.1	0.1	0.1	0	60
trivan	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	15	3	0
triwis	55	0	0	0	65	15	40	35	0.5	0	40	45	0.1	0	30	40	2
trilol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0
triapp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
viglan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vigspH	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yakaus	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0
zalgal	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0

Site	Q70	Q71	Q72	Q75	Q78	Q79	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12
VegType	P2	H7	H6	H2	P1	H8	D4	D4	H2	D3	D3	D1	D5	D3	D4	H3	H6	D4
Landform	Gravelly plain	Hill	Hill	Hill	Saline plain	Hill	Major creek	Major creek	Hill	Major creek	Major creek	Major creek	Minor creek	Major creek	Major creek	Hill	Hill	Major creek
FGcover	m	q	aa	t	n	k	j	i	t	c	c	e	ad	d	d	v	aa	g
FG25% sim	d	e	f	e	d	b	a	a	e	a	a	a	g	a	a	f	f	a
Abutil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumac	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
abumal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuoxy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuspD	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0.1	0	0.1
AbuspP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaacr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaado	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaamp	0	0	0	0	0	0	0.1	0	0	0	0	0.5	0	0	0	0	0	0
acaaph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0
acaaphP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acabiv	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
acacol	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0.1	0	0	0.1
acacor	0	0	0	0	0	0	0.1	1	0.1	8	8	0	0	0.1	0.1	0	0	8
acaeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acahil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaina	0	0	3	0.1	0	0.25	0	0	0.5	0	0	0	0	0	0	2	2	0
acaort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapyr	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0	0	0.1
acasyn	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
acatet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatra	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0.1	5	0	0	0	0.1
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	0
achasp	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
aesind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altang	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
altden	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
altnan	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0	0	0	0	0
alymue	0	0	0.1	0	0	0	0.1	0.1	0	0.1	0	0	0.1	0	0.1	0	0	0.1
amacus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
amaund	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0	0.1	0.1	0	0.1	0.1
ammbac	0	0	0	0	0	0	0.1	0	0	0.1	0	0.1	0	0	0.1	0	0	0
ammmul	0	0	0	0	0	0	0.1	0	0	0.1	0	0.1	0	0	0	0	0	0
aricon	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
arihol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arilat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arivis	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
atahem	0	0	0	0	0	0	0.1	1	0	0	0.1	1	0.1	0.1	0	0	0	0.1
berped	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
boebur	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0	0	0
boecoc	0.1	0.1	0.1	0.1	0	0	0.1	0	0.1	0	0	0	0.1	0.1	0	0	0	0.1
boegar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonere	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpan	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
bonpil	0	0.1	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0.1	0
botewa	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1
bulbar	0	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0.1	0
bultur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cajcin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
caltep	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
carlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cascap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cencsp	0	0	0	0	0	0.1	40	50	0	0.5	0.1	55	2.1	10	20	0	0.1	32
cenmin	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0.1	0	0	0

Site	Q70	Q71	Q72	Q75	Q78	Q79	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12
chlpec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chlpum	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
chrfal	0	0	0	0	0	0	0	0	0	0.1	0.1	0	10	0	0.1	0	0	1
cleflo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
concle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corinc	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
corpar	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
cortri	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0.1
corham	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0.5	0	0	0	0	0.5
crocun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0
cucmel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
cucpic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucvar	0	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0	0.1	0.1
culleu	0	0	0	0	0	0	0	0.1	0	0	0	0	0	1	0	0	0	0.1
culpog	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cymamb	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0.1	0.1	0.1	0
cymobt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cyncon	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0
cynpro	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
cypdif	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
cypiri	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
cypixi	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0.1	0.1	0	0	0
cypsqu	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0	0
cypvag	0	0	0	0	0	0	0.1	0.1	0	0	0	0.5	0	0.1	0.1	0	0	1
dacrad	0	0	0	0	0.5	0	0.1	0.1	0	0.1	0	0	0.1	0.1	0.1	0	0	0
damcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
descam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
desmue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dicser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
digcte	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0
dipfus	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0
dupcom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
dyspla	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
dysrha	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
enncae	0.1	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennpol	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
eracra	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
eracum	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0	0.1	0.1	0.1	0	0	0
erades	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eradie	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eralep	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
eraten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
erefor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erelon	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
eriben	0	0	0	0	0	0	0.1	0	0	15	5	0	0	15	0	0	0	0
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eripul	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0
eriten	0.1	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
eriten	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	1
eryves	0	0	0	0	0	0	1	0	0	0	0	0.1	0	0	0	0	0	0
euccam	0	0	0	0	0	0	0	0	0	0	0	55	0	0	0	0	0	0
eucleu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucsoc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucvic	0	0	0	0	0	0	4	20	0	20	25	0	0	11	15	0	0	29
eulaur	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0.1	0	1	1	0	0	0.1
eupaus	0	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0.1
eupaus	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1
eupboo	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

Site	Q70	Q71	Q72	Q75	Q78	Q79	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12
eupcar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
eupina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptan	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
euptri	0	0	0.1	0	0	0	0	0.1	0	0.1	0	0.1	0	0.1	0.1	0	0	0
eupvacE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupvacV	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
evoals	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
fimdep	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
fimdic	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
fimmic	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0	0
fimsim	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fluvir	0	0	0	0	0	0	0	0.1	0	0	0	2	0	0.1	0	0	0	0.1
glycan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomaff	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
gomcun	0.1	0.1	0.1	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0.1	0	0	0.1
gomkan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goocus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goofor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goolam	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
goomic	0.1	0.1	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
goomue	0	0	0.1	0	0	0.1	0	0	0.1	0	0	0	0.1	0.1	0	0	0	0
goonud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goosto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gosaus	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0.1
gosrob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grepyr	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0.1
grewic	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0
hakcho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
haklor	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0
halgos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helchr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helhet	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helpac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helske	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibcoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuC	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
hibstuG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
hybaur	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0	0	0.1
indpar	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0
indcol	0	0	0.1	0.1	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0.1	0
indlin	0	0	0.1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indlin	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0
indmon	0	0.1	0.1	0	0	0.1	0	0	0.1	0.1	0	0	0.5	0	0.1	0.1	0	0.1
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcop	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0	0	0.1
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
ipomue	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0	0	0.1	0	0	0	0.1
ipople	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
ipopol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
iporac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
isedol	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
isoatr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ludper	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0	0
maieri	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
maicar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maigeo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maimel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
marhir	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0.1	0.1	0	0	0
melele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melglo	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0
mellin	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0
melobl	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0

Site	Q70	Q71	Q72	Q75	Q78	Q79	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12
nepdim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
notdec	0.1	0	0	0.1	0	0	0.1	0.1	0.1	0	0	0	0.1	0	0	0	0	0.1
oldcro	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
oldspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pandec	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
parmue	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
pascle	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pasrar	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0
pepspE	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
perrar	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0	0	0	0	0
petlab	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
phymad	0	0	0	0	0	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1
pluden	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0.1	0	0	0	0
plufer	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
plurub	0	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0	0.1	0.1	0	0	0
plutet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
polcor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
polhol	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
polgla	0	0.1	0	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
polamb	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0.1	0	0	0	0.1
portole	0.1	0.1	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0
ptesph	0	0	0	0	0	0.1	0	0.1	0	0	0	0.1	0	0.1	0	0	0	0
ptiaer	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiast	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiaur	0.1	0	0.1	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0	0
ptiaxi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptical	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
pticle	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiexa	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptifus	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptigom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiobo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rhymin	0	0	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0.1	0.1	0.1	0.1
rosads	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
salaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sanlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
scaamb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0
schsub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcos	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclhos	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
senartH	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SenartO	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0.1	0	0
senartOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartOH	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluG	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0
sengluGL	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
sengluP	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
sengluL	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sennot	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sensym	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sescan	0	0	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0.1	0.1	0	0	0.1
sidaffP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
sidech	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
sidfib	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
sidroh	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
sidspP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	Q70	Q71	Q72	Q75	Q78	Q79	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12
sidspS	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
soldiv	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0.1	0.1	0	0	0
solhor	0.1	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0.1
sollas	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solphl	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
solspM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
spoact	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
spoaus	0.1	0.1	0.1	0.1	1	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0.1	0	0.1	0
stamur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
stegro	0	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0
strbub	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
strdec	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
strlia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
swaste	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
syntil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
teprosC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1
teprosF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspBC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspCS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspN	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspNW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thetri	0	0	0	0	0	0	0	0	0	0	0.1	0	15	0	0	0.1	0	0
tinsmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traole	0	0.1	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
traaus	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tritri	0	0	0	0	0.1	0	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0
trihir	0.1	0.1	0.1	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0.1
tripla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trispLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trisub	0.1	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0
trizey	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1
trimol	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0
tribri	0.1	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0
triepa	0	0.1	50	1	0	0.1	0	0	1	0	0.1	0	2	0	0	3	35	0
trilon	45	0.1	0	0	20	0.5	0.1	0.1	0	0.1	0	0	0.1	3	3	0	0.1	0
trivan	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triwis	2	5	0	45	0	1	0	0	45	0	0	0	0	0	0	25	0	0
trilol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triapp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
viglan	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0.1	0.1	0	0	0
vigspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yakaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
zalgal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R25	R26	R27	R31
VegType	D1	D4	D1	D1	D4	D4	P2	M1	D1	D2	D4	D4	M1	D4	D4
Landform	Major creek	Major creek	Major creek	Major creek	Major creek	Major creek	Gravelly plain	Hill	Major creek	Major creek	Major creek	Major creek	Hill	Major creek	Major creek
FGcover	j	j	j	j	j	j	m	o	e	b	f	i	o	h	f
FG25% sim	a	a	a	a	a	a	d	d	a	a	a	a	d	a	a
Abutil	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
Abulep	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
abumac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abumal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuoxy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
abuspD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AbuspP	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
acaacr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaado	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaamp	1	0.1	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0
acaaph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaaphP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaapt	0	0	0	0	0	0	0	20	0	0	0	0	1	0	0
acaaye	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
acabiv	0	0.1	0	0	0	0.1	0.1	0	0.1	0	0.1	0	0	0.1	0
acacol	0	0	0.1	0	0.1	0.1	0	0	0	0	0	0	0	0	0
acacor	0.1	1	1	0.1	5	5	0	0	0.5	2	0	3	0	0.5	0
acaeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acahil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acaort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapru	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
acapty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acapyr	0.1	0.1	0.1	0	0.1	0.1	0	0	0.1	3	0.1	0	0	0.5	2
acasyn	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
acatet	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
acatra	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0
acatraP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
acatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
achasp	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
aesind	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
altden	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
altnan	0	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0
alymue	0	0.1	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0
amacus	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
amaund	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0	0.1	0	0.1	0.1
ammbac	0.1	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	0
ammmul	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
aricon	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0	0	0	0.1
arihol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arilat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
arivis	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	1
atahem	2	0.1	2	0.5	5	0.5	0	0	1	2	3	0.1	0	0.5	3
berped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boebur	0.1	0.1	0	0.1	0.1	0.1	0.1	0	0	0	0	0.1	0.1	0	0
boecoc	0	0.1	0	0.1	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1
boegar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
boepal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonere	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bonpil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
botewa	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1
bulbar	0	0.1	0	0.1	0	0.1	0.1	0	0	0	0	0.1	0	0	0
bultur	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
cajcin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
caltep	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
capumb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
carlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cascap	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
cencsp	45	20	50	32	35	28	0.1	0	13.1	0.1	85	85	0	40	42
cenmin	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0

Site	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R25	R26	R27	R31
chlpec	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
chlpum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
chrfal	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0
cleflo	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
concle	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0
corinc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
corpar	0	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0	0	0
corpar	0.1	0.1	0	0	0.1	0	0.1	0	0	0.1	0.1	0	0	0	0.1
cortri	0	0	0.1	0.1	0	0	0	0	0.1	0	0	0.1	0	0.1	0
corham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
crocun	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
cromed	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0
cucmel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cucpic	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
cucvar	0.1	0.1	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
culleu	0.1	0	0	0	0.1	0.1	0	0	0	0	0	0.1	0	0	0
culpog	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
culsti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cymamb	0	0	0	0.1	0	0	0	0	0.1	0.1	0	0	0	0	0.1
cymobt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cyncon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cynpro	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
cypbif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypdif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypiri	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
cypixi	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cypsqu	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
cypvag	2	0.5	0.1	5	0.5	2	0	0	1	0	0	0.1	0	0	0
dacrad	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0.1	0
damcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
descam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
desmue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dicser	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
digcte	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dipfus	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
dipgra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dupcom	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0
dyspla	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
dysrha	0	0	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0.1	0.1
dyssph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ehrsal	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
enncae	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0.1
enncyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ennpol	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1	0	0
eracra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eracum	0.1	0.1	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0.1	0
erades	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eradie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eraeri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eralep	0	0.1	0.1	0	0	0.1	0	0	0	0	0	0.1	0	0	0
eraten	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1
erefor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erelon	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1
eriben	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
erifla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eripul	0	0	0	0	0	0	0	0	0	0.1	0	0	8	0	0
eriten	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
eriten	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
eryves	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euccam	5	0	15	10	0	0	0	0	25	0	0	0	0	0	0
eucleu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucsoc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eucvic	5	9	25	21	15	8	0	0	10	5	0.1	35	0	15	6
eulaur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupaus	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0	0	0.1	0	0.1	0
eupaus	0.1	0.1	0.1	0	0	0	0	0.1	0	0.1	0	0.1	0	0.1	0.1
eupboo	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0

Site	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R25	R26	R27	R31
eupcar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eupina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
euptan	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0
euptri	0	0	0	0.1	0.1	0.1	0	0	0	0	0.1	0	0	0	0
eupvacE	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
eupvacV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
evoals	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1	0
fimdep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimdic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fimmic	0.1	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
fimsim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
fluvir	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0
glycan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
gomaff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gomcun	0	0	0	0	0	0	0.1	0	0	0.1	0.1	0	0	0	0
gomkan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goocus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goofor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goolam	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
goomic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goomue	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
goonud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goosto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gosaus	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
gosrob	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0.3
grepyr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grewic	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
hakcho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
haklor	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
halgos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helchr	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
helhet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helhet	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
helova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helpac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helske	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
helten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibbra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibcoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hibstuP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hybaur	0	0.1	0	0	0	0	0	0	0.1	0.1	0	0	0	0.1	0.1
indpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcol	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0.1	0	0	0
indlin	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
indlin	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
indmon	0	0.1	0	0	0	0.1	0	0	0.1	0.1	0.1	0	0	0	0.1
indrug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
indcop	0	0	0	0	0	0.1	0	0	0.1	0	0	0.1	0	0	0.1
ipocop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipomue	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0
ipople	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
ipopol	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
iporac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
isedol	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0
isoatr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ludper	0.1	0.1	0.1	1	0	0	0	0	0	0	0	0	0	0	0
maieri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maicar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
maigeo	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0
maimel	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
marhir	0	0.1	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0
melele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
melglo	1	15	2	3	18	10	0	0	0	0	0	0	0	0	0
mellin	0	0	0	0	2	13	0	0	0	0	0	0	0	0	0
melobl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R25	R26	R27	R31
nepdim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
notdec	0	0.1	0	0	0	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0.1
oldcro	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0
oldspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
opeaeq	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1
pandec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
parmue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pascle	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0.1	0
pasrar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pepspE	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
perrar	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
petlab	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
phyexi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
phymad	0.1	0.1	0	0.1	0.1	0.1	0	0	0.1	0.1	0	0	0	0.1	0.1
pluden	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
plufer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
plurub	0.1	0	0	0.1	0	0.1	0	0	0.1	0	0	0.1	0	0	0.1
plutet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
polcor	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
polhol	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
polgla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
polamb	0	0.1	0	0	0	0.1	0	0	0.1	0	0.1	0.1	0	0	0
portole	0	0	0	0.1	0	0	0.1	0	0	0	0	0.1	0	0	0
ptesph	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0.1	0
ptiaer	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
ptiast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiaur	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
ptiaxi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptical	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pticle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiexa	0	0	0	0	0	0	0.1	0.1	0.1	0	0.1	0	0.1	0	0.1
ptifus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptigom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptihel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ptiobo	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1
rhymin	0	0	0	0	0	0.1	0	0	0.1	0	0.1	0.1	0	0.1	0.1
rosads	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
salaus	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1
sanlan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
scaamb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schlae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
schsub	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
sclcor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclcun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sclhos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartH	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0
SenartO	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1
senartOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
senartOH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluC	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
sengluG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sengluGL	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
sengluP	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
sengluL	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
senham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sennot	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0
sensym	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sescan	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
sidaffP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidech	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidfib	0	0	0	0	0.1	0	0	0	0	0	0.1	0.1	0	0	0
sidroh	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sidspP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Site	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R25	R26	R27	R31
sidspS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
soldiv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
solhor	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
sollas	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0
solphl	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
solspM	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
spoact	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0
spoaus	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1
stamur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
stegro	0.1	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0	0	0	0	0.1
strbub	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0.1	0	0.1	0
strdec	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
strlia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
swaste	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0
syntil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepcle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
teprosC	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0.1	0
teprosF	0	0.1	0	0	0	0	0	0	0	2	0.1	0	0	0	1
tepspBC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspCS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tepspNW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
thespHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
thetri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tinsmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
traole	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
traaus	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
tritri	0.1	0.1	0	0.1	0	0.1	0	0.1	0	0	0	0.1	0.1	0	0.1
trihir	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0	0.1	0	0
tripla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trispLS	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0
trisub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trizey	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0.1	0	0	0	0.1
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tribri	0	0	0	0	0	0	0.1	0.5	0	0	0	0	0.1	0	0
triepa	0	0.1	0	0	0	0	1	15	0	0	0	0.1	0.1	0	0
trilon	0.1	1	0	0.1	0.5	0.5	55	20	0	0.1	0.1	0.5	12	0.5	0.1
trivan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triwis	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0
trilol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
triapp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tricle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
trimac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
venvim	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1
viglan	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
vigspH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vinlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
walind	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
yakaus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
zalgal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1: List of taxa that were omitted or treated as other taxa for the purposes of the floristic analysis.

Taxon	Name Referred to for Analysis
Acacia orthocarpa (wispy form)	Acacia orthocarpa
Cenchrus ciliaris	Cenchrus spp.
Cenchrus setiger	Cenchrus spp.
Corchorus lasiocarpus subsp. lasiocarpus	Corchorus lasiocarpus
Dysphania rhadinostachya subsp. rhadinostachya	Dysphania rhadinostachya
Evolvulus alsinoides var. decumbens	Evolvulus alsinoides
Evolvulus alsinoides var. villosicalyx	Evolvulus alsinoides
Portulaca intraterranea	Portulaca oleracea/intraterranea
Solanum ? horridum	Solanum horridum
Themeda ?. sp. Hamersley Station (M.E. Trudgen 11431)	Themeda sp. Hamersley Station (M.E. Trudgen 11431)
Chara sp.	omitted; alga; singleton
Abutilon sp.	omitted; indeterminate taxon
Boerhavia sp.	omitted; indeterminate taxon
Calandrinia sp.	omitted; indeterminate taxon
Corchorus sp.	omitted; indeterminate taxon
Cymbopogon sp.	omitted; indeterminate taxon
Dysphania sp.	omitted; indeterminate taxon
Euphorbia sp. (biconvexa/coghlanii/trigonosperma; sterile)	omitted; indeterminate taxon
Frankenia sp.	omitted; indeterminate taxon
Heliotropium sp.	omitted; indeterminate taxon
Lepidium sp.	omitted; indeterminate taxon
Polymeria sp.	omitted; indeterminate taxon
Sida sp.	omitted; indeterminate taxon
Solanum sp.	omitted; indeterminate taxon
Streptoglossa sp.	omitted; indeterminate taxon
Tribulus sp.	omitted; indeterminate taxon
Triumfetta sp.	omitted; indeterminate taxon
Abutilon fraseri subsp. fraseri	omitted; singleton
Acacia ancistrocarpa	omitted; singleton
Acacia ayersiana	omitted; singleton
Acacia eriopoda x trachycarpa	omitted; singleton
Acacia maitlandii	omitted; singleton
Acacia marramamba	omitted; singleton
Acacia monticola	omitted; singleton
Acacia spondylophylla	omitted; singleton
Amaranthus ? interruptus	omitted; singleton
Androcalva luteiflora	omitted; singleton
Aristida pruinosa	omitted; singleton
Aristida burbidgeae	omitted; singleton
Atriplex codonocarpa	omitted; singleton
Austrobryonia pilbarensis	omitted; singleton
Basilicum polystachyon	omitted; singleton
Bergia ammannioides	omitted; singleton
Bergia trimera	omitted; singleton
Blumea tenella	omitted; singleton
Bonamia media	omitted; singleton
Calandrinia stagnensis	omitted; singleton
Calytrix carinata	omitted; singleton
Capparis lasiantha	omitted; singleton
Cassytha filiformis	omitted; singleton
Commelina ensifolia	omitted; singleton
Crotalaria dissitiflora subsp. benthamiana	omitted; singleton
Cullen graveolens	omitted; singleton
Cyperus bulbosus	omitted; singleton
Cyperus hesperius	omitted; singleton
Dicladanthera forrestii	omitted; singleton

Taxon	Name Referred to for Analysis
Dodonaea coriacea	omitted; singleton
Dodonaea lanceolata var. lanceolata	omitted; singleton
Eleocharis atropurpurea	omitted; singleton
Enneapogon robustissimus	omitted; singleton
Enteropogon ramosus	omitted; singleton
Eragrostis exigua	omitted; singleton
Eragrostis olida	omitted; singleton
Eragrostis xerophila	omitted; singleton
Eremophila latrobei subsp. latrobei	omitted; singleton
Eriachne lanata	omitted; singleton
Euphorbia coghlanii	omitted; singleton
Fimbristylis elegans	omitted; singleton
Gonocarpus ephemerus	omitted; singleton
Goodenia prostrata	omitted; singleton
Goodenia triodiophila	omitted; singleton
Grevillea berryana	omitted; singleton
Hakea chordophylla	omitted; singleton
Heliotropium conocarpum	omitted; singleton
Heliotropium inexplicitum	omitted; singleton
Heliotropium tanythrix	omitted; singleton
Heliotropium tenuifolium	omitted; singleton
Hibiscus austrinus var. austrinus	omitted; singleton
Hibiscus burtonii	omitted; singleton
Indigofera hirsuta	omitted; singleton
Indigofera rugosa	omitted; singleton
Iseilema vaginiflorum	omitted; singleton
Jasminum didymum subsp. lineare	omitted; singleton
Lepidium phlebopetalum	omitted; singleton
Lipocarpha microcephala	omitted; singleton
Maireana planifolia	omitted; singleton
Maireana villosa	omitted; singleton
Melaleuca argentea	omitted; singleton
Melaleuca bracteata	omitted; singleton
Oldenlandia galioides	omitted; singleton
Panicum laevinode	omitted; singleton
Paspalidium retiglume	omitted; singleton
Pentalepis trichodesmoides subsp. trichodesmoides	omitted; singleton
Plumbago zeylanica	omitted; singleton
Polycarpaea longiflora	omitted; singleton
Polymeria mollis	omitted; singleton
Portulaca cyclophylla	omitted; singleton
Portulaca filifolia	omitted; singleton
Potamogeton tricarinatus	omitted; singleton
Pterocaulon serrulatum var. velutinum	omitted; singleton
Ptilotus carinatus	omitted; singleton
Ptilotus incanus	omitted; singleton
Ptilotus rotundifolius	omitted; singleton
Ptilotus schwartzii	omitted; singleton
Rhagodia eremaea	omitted; singleton
Rhagodia sp. Hamersley (M. Trudgen 17794)	omitted; singleton
Rotala diandra	omitted; singleton
Scaevola browniana subsp. browniana	omitted; singleton
Scaevola spinescens	omitted; singleton
Sclerolaena eriacantha	omitted; singleton
Sclerolaena lanicuspis	omitted; singleton
Senna glutinosa subsp. glutinosa x	omitted; singleton
Senna venusta	omitted; singleton
Sida arsiniata	omitted; singleton
Sorghum plumosum var. plumosum	omitted; singleton

Taxon	Name Referred to for Analysis
Stemodia viscosa	omitted; singleton
Swainsona decurrens	omitted; singleton
Swainsona thompsoniana	omitted; singleton
Tephrosia clementii	omitted; singleton
Tephrosia supina	omitted; singleton
Tephrosia virens	omitted; singleton
Trianthema cusackianum	omitted; singleton
Tribulus macrocarpus	omitted; singleton
Triodia basedowii	omitted; singleton
Triumfetta chaetocarpa	omitted; singleton
Typha domingensis	omitted; singleton
Urochloa subquadripara	omitted; singleton
Aerva javanica	omitted; weed
Azadirachta indica	omitted; weed
Bidens bipinnata	omitted; weed
Calotropis procera	omitted; weed
Citrullus colocynthis	omitted; weed
Cynodon dactylon	omitted; weed
Echinochloa colona	omitted; weed
Eragrostis cilianensis	omitted; weed
Euphorbia hirta	omitted; weed
Flaveria trinervia	omitted; weed
Indigofera hochstetteri	omitted; weed
Malvastrum americanum	omitted; weed
Passiflora foetida var. hispida	omitted; weed
Physalis angulata	omitted; weed
Setaria verticillata	omitted; weed
Sigesbeckia orientalis	omitted; weed
Solanum nigrum	omitted; weed
Sonchus oleraceus	omitted; weed
Stylosanthes hamata	omitted; weed
Trianthema portulacastrum	omitted; weed
Tribulus terrestris	omitted; weed
Vachellia farnesiana	omitted; weed

Table 2: Number of sites from the current surveys in each floristic group at the 25% similarity level (based on cover of all species).

Veg Code	Floristic Group						
	a	*b*	*c*	*d*	*e*	*f*	*g*
D1	5						
D2	3						
D3	4						
D4	13						
D5							2
C1			3				
M1				2			
P1				7			
P2				3			
P3						3	
P4	1					1	4
P5					3		
H1					7		
H2					7		
H3						3	
H4						4	
H5						5	
H6						14	
H7					4		
H8		4					

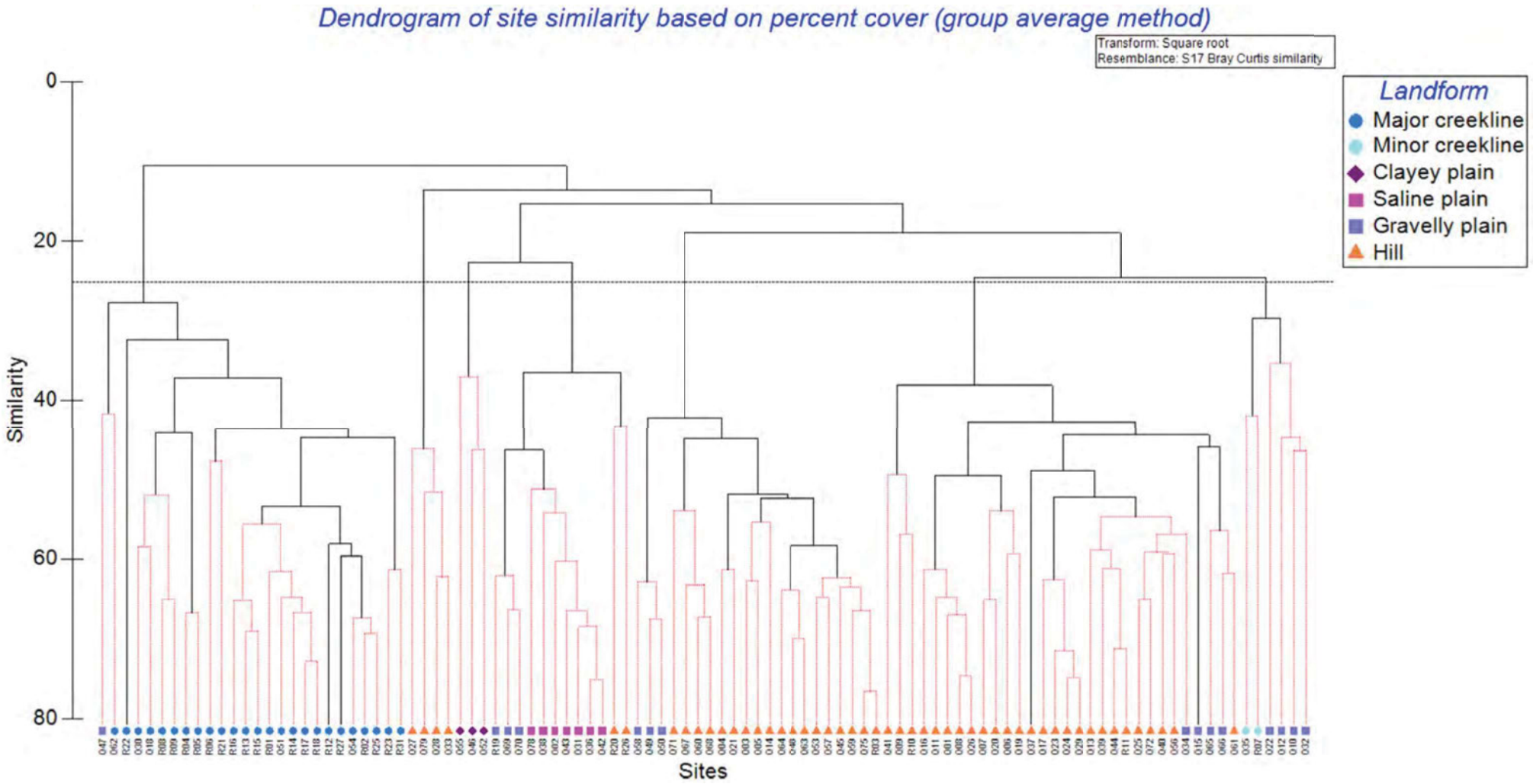


Figure 1: Dendrogram based on percent cover of all species at each site sampled during the current survey work, coded by habitat type.

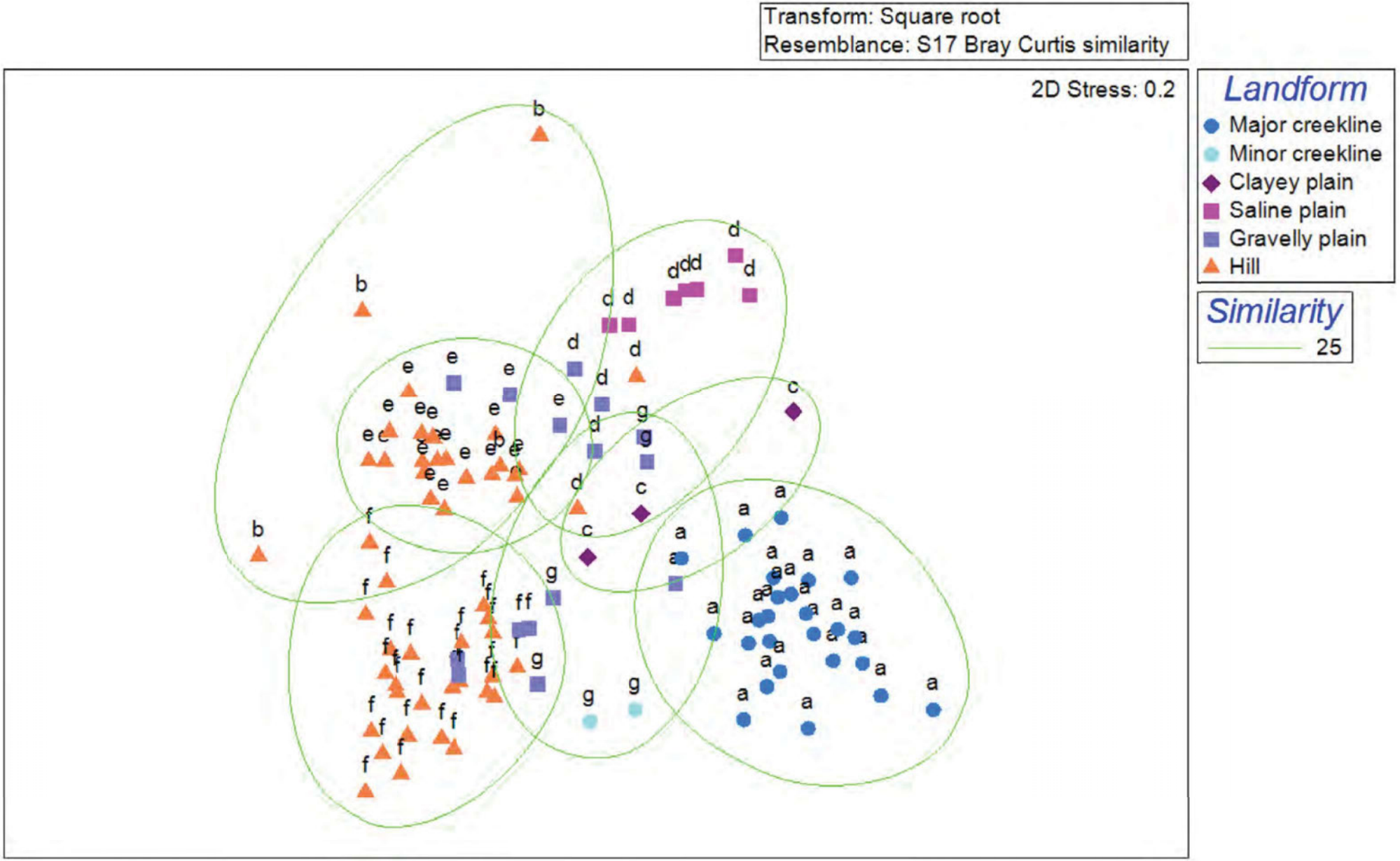


Figure 2: NMDS plot based on percent cover of all species at each site sampled during the current survey work (symbols indicate habitat type; letters indicate floristic group at 25% similarity).

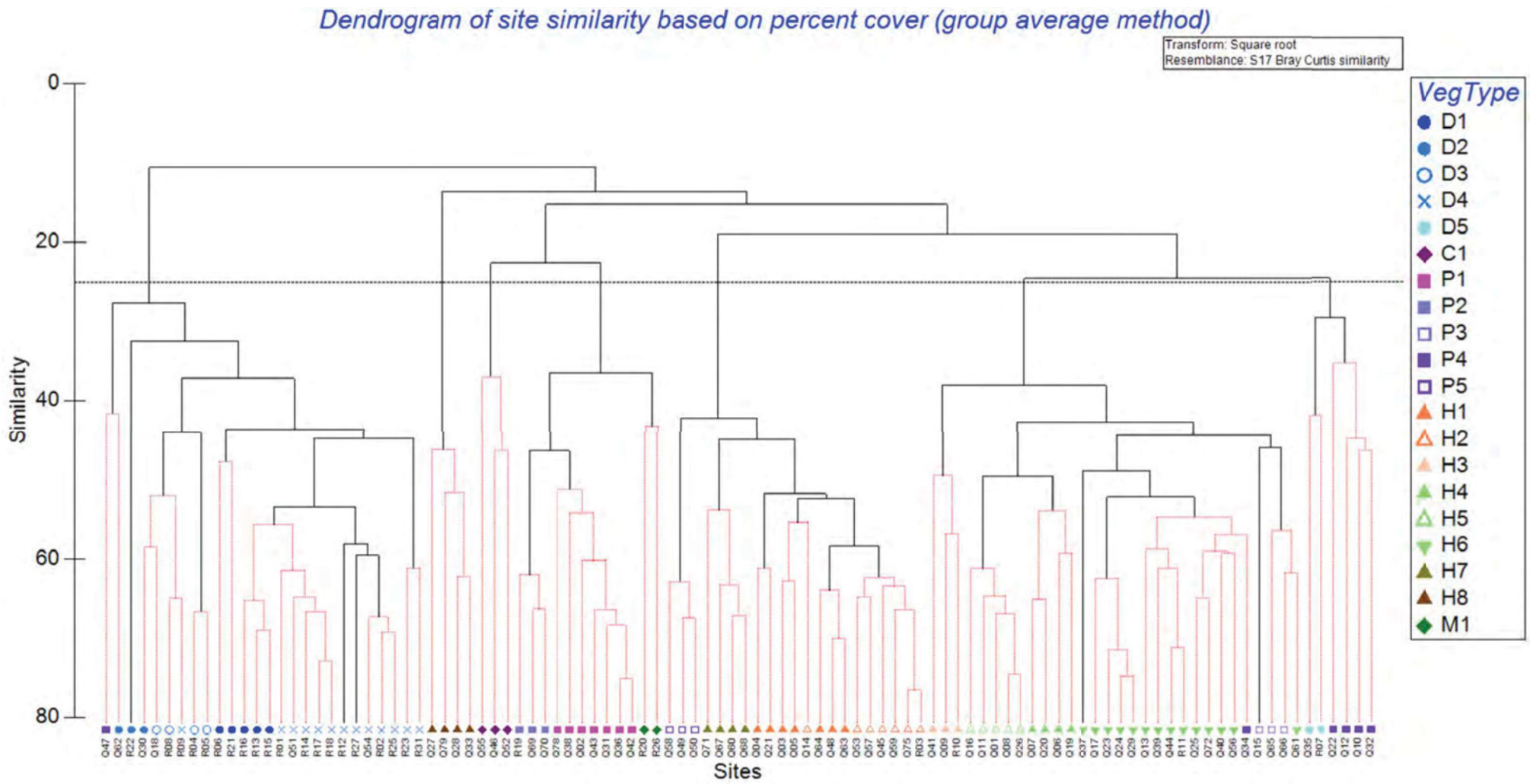


Figure 3: Dendrogram based on percent cover of all species at each site sampled during the current survey work, coded by vegetation type.

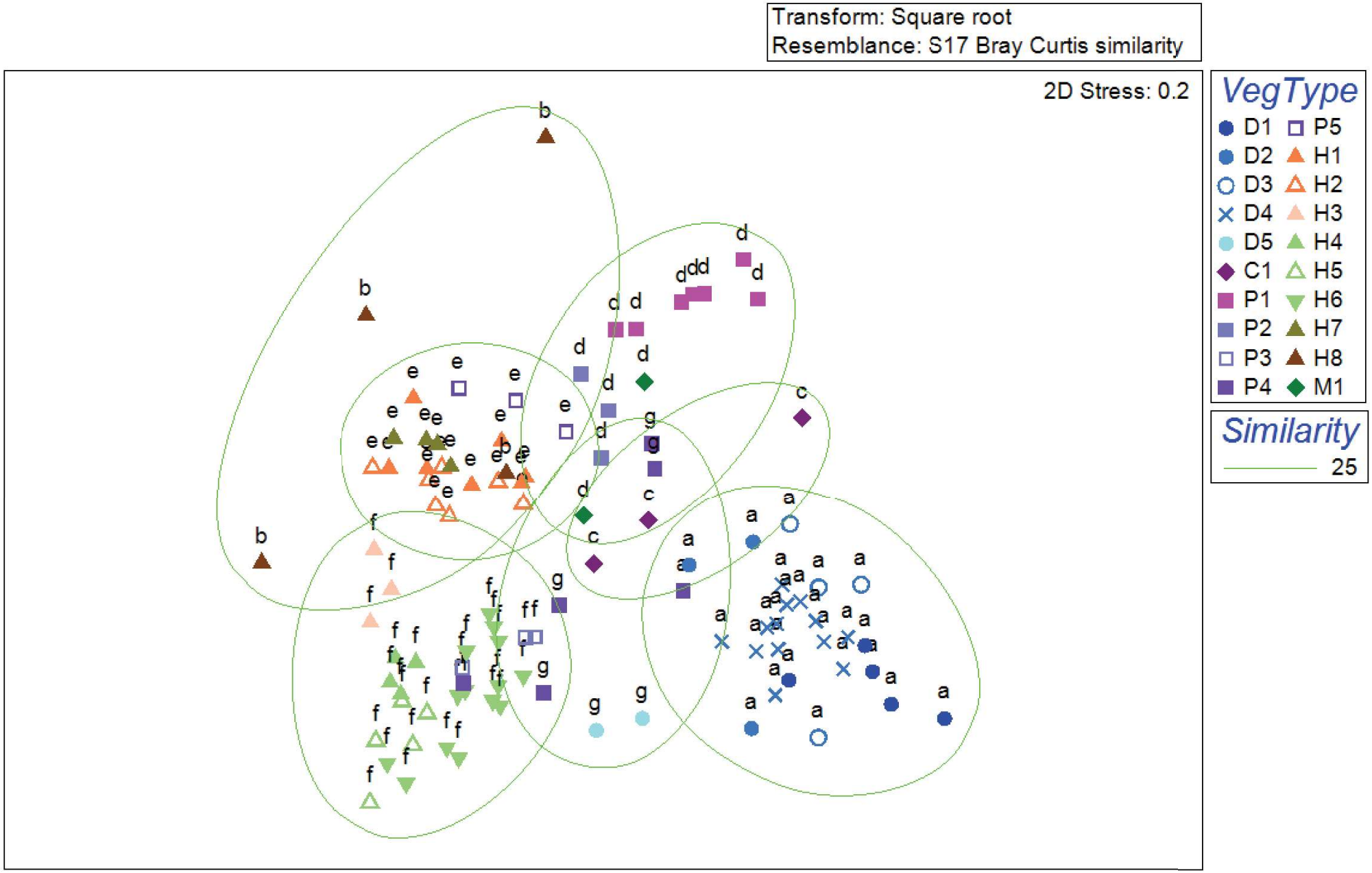


Figure 4: NMDS plot based on percent cover of all species at each site sampled during the current survey work (symbols indicate vegetation unit; letters indicate floristic group at 25% similarity).

Table 3: Indicator species for the floristic groups identified through the SIMPROF test for the current survey (based on cover of all species), together with sites in each vegetation type.

Floristic Group	SIMPER Indicator Species (maximum of top 5) (Cumulative Similarity)	Veg Code	Sites
a	*Indigofera linifolia*, **Cenchrus* spp., *Abutilon* sp. Dioicum, *Acacia pyrifolia*, *Alternanthera nana* (29%)	D2	1 (Q62)
		P4	1 (Q47)
b	NA (<2 samples); apparently separated due to a higher cover of *Acacia pyrifolia* and *Tephrosia rosea* var. Fortescue Creeks and very little **Cenchrus* spp. compared to other creek sites.	D2	1 (R22)
c	*Eucalyptus victrix*, *Acacia coriacea*, *Eriachne benthamii*, *Acacia pyrifolia*, *Cenchrus* spp. (78%)	D3	2 (R04, R05)
d	*Eucalyptus victrix*, *Triodia longiceps*, *Acacia trachycarpa*, **Cenchrus* spp., *Eriachne benthamii* (43%)	D2	1 (Q30)
		D3	2 (Q18, R08)
		D4	1 (R09)
e	*Eucalyptus camaldulensis*, **Cenchrus* spp., *Atalaya hemiglauca*, *Cyperus vaginatus*, *Amaranthus undulatus* (89%)	D1	2 (R06, R21)
f	**Cenchrus* spp., *Atalaya hemiglauca*, *Acacia pyrifolia*, *Aristida contorta*, *Boerhavia coccinea* (64%)	D4	2 (R23, R31)
g	NA (<2 samples); most similar to FG_h and FG_i; apparently separated due to a slightly higher cover of *Acacia coriacea* and *Eucalyptus victrix*; the presence of *Cyperus vaginatus* and *Corymbia hamersleyana*; and the absence of *Acacia tumida* var. *pilbarensis*.	D4	1 (R12)
h	NA (<2 samples); most similar to FG_i; apparently separated due to a slightly lower cover of **Cenchrus* spp., *Eucalyptus victrix* and *Acacia coriacea*; slightly more *Acacia pyrifolia*; and the presence of *Acacia tumida* var. *pilbarensis*.	D4	1 (R27)
i	**Cenchrus* spp., *Eucalyptus victrix*, *Acacia coriacea*, *Alysicarpus muelleri*, *Amaranthus undulatus* (65%)	D4	3 (Q54, R02, R25)
j	**Cenchrus* spp., *Eucalyptus victrix*, *Melaleuca glomerata*, *Acacia coriacea*, *Atalaya hemiglauca* (64%)	D1	3 (R13, R15, R16)
		D4	5 (Q51, R01, R14, R17, R18)
k	*Triodia brizoides*, *T. wiseana*, *Acacia aphanoclada*, *T. longiceps*, *A. bivenosa* (87%)	H8	4 (Q27, Q28, Q33, Q79)
l	*Triodia epactia*, *T. longiceps*, *Neptunia dimorphantha*, **Cenchrus* spp., *Arivela viscosa* (32%)	C1	3 (Q46, Q52, Q55)
m	*Triodia longiceps*, *T. wiseana*, *Acacia bivenosa*, *Enneapogon caerulescens*, *E. polyphyllus* (66%)	P2	3 (Q69, Q70, R19)
n	*Triodia longiceps*, *Sporobolus australasicus*, *Trianthema triquetrum*, *Acacia bivenosa* (91%)	P1	7 (Q02, Q31, Q36, Q38, Q42, Q43, Q78)
o	*Triodia longiceps*, *Acacia aptaneura*, *Cucumis variabilis*, *Dactyloctenium radulans*, *Enneapogon caerulescens* (66%)	M1	2 (R20, R26)
p	*Triodia wiseana*, *Eucalyptus socialis*, *T. longiceps*, *Arivela viscosa*, *Eragrostis desertorum* (51%)	P5	3 (Q49, Q50, Q58)
q	*Triodia wiseana*, *T. vanleeuwenii*, *Arivela viscosa*, *Eriachne tenuiculmis*, *Goodenia microptera* (49%)	H7	4 (Q60, Q67, Q68, Q71)
r	*Triodia wiseana*, *Acacia bivenosa*, *A. inaequilatera*, **Cenchrus* spp., *Corchorus parviflorus* (74%)	H1	2 (Q04, Q21)
s	*Triodia wiseana*, *Acacia bivenosa*, *A. inaequilatera*, *Bonamia pilbarensis*, **Cenchrus* spp. (51%)	H1	3 (Q48, Q63, Q64)
t	*Triodia wiseana*, *Acacia inaequilatera*, *Arivela viscosa*, *Cucumis variabilis*, *Notoleptopus decaisnei* (71%)	H2	6 (Q45, Q53, Q57, Q59, Q75, R03)
u	*Triodia wiseana*, *Corchorus parviflorus*, *Enneapogon caerulescens*, *Gossypium australe*, *Senna artemisioides* subsp. *helmsii* (73%)	H1	2 (Q03, Q05)
		H2	1 (Q14)
v	*Triodia wiseana*, *T. epactia*, *Acacia inaequilatera*, *Bonamia pilbarensis*, *Corchorus parviflorus* (85%)	H3	3 (Q09, Q41, R10)

Floristic Group	SIMPER Indicator Species (maximum of top 5) (Cumulative Similarity)	Veg Code	Sites
w	*Triodia epactia, Acacia orthocarpa, A. bivenosa, Senna glutinosa* subsp. *glutinosa, Corchorus parviflorus* (89%)	**H5**	5 (Q01, Q08, Q11, Q16, Q26)
x	*Triodia epactia, Acacia bivenosa, Aristida contorta, Corchorus parviflorus, Fimbristylis dichotoma* (62%)	**H4**	4 (Q06, Q07, Q19, Q20)
y	NA (<2 samples); most similar to FG_{aa}; appeared separated due to the presence of *Acacia acradenia* and *Triumfetta appendiculata*; slightly more *Indigofera monophylla*; and slightly less *Triodia epactia* and *Acacia inaequilatera*.	**H6**	1 (Q37)
z	*Triodia epactia, Acacia inaequilatera, Cymbopogon ambiguus, Gossypium australe, Grevillea wickhamii* (81%)	**H6**	4 (Q17, Q23, Q24, Q29)
aa	*Triodia epactia, Acacia inaequilatera, Corchorus parviflorus, Bonamia pilbarensis, Arivela viscosa* (73%)	**H6**	8 (Q13, Q25, Q39, Q40, Q44, Q56, Q72, R11)
		P4	1 (Q34)
ab	NA (<2 samples); most similar to FG_{ac}; appeared separated mainly due to slightly more *Acacia synchronicia*; slightly less *Triodia epactia*; the presence of *Fimbristylis dichotoma*; and the absence of *Acacia inaequilatera* and **Cenchrus* spp.	**P3**	1 (Q15)
ac	*Triodia epactia, Acacia inaequilatera, Aristida contorta, Arivela viscosa, Corchorus tridens* (51%)	**H6**	1 (Q61)
		P3	2 (Q65, Q66)
ad	*Acacia tumida* var. *pilbarensis, Chrysopogon fallax, Triodia epactia, Corymbia hamersleyana, *Cenchrus* spp. (56%)	**D5**	2 (Q35, R07)
ae	*Triodia longiceps, T. epactia, Acacia trachycarpa, Bulbostylis barbata, Arivela viscosa* (45%)	**P4**	4 (Q10, Q12, Q22, Q32)

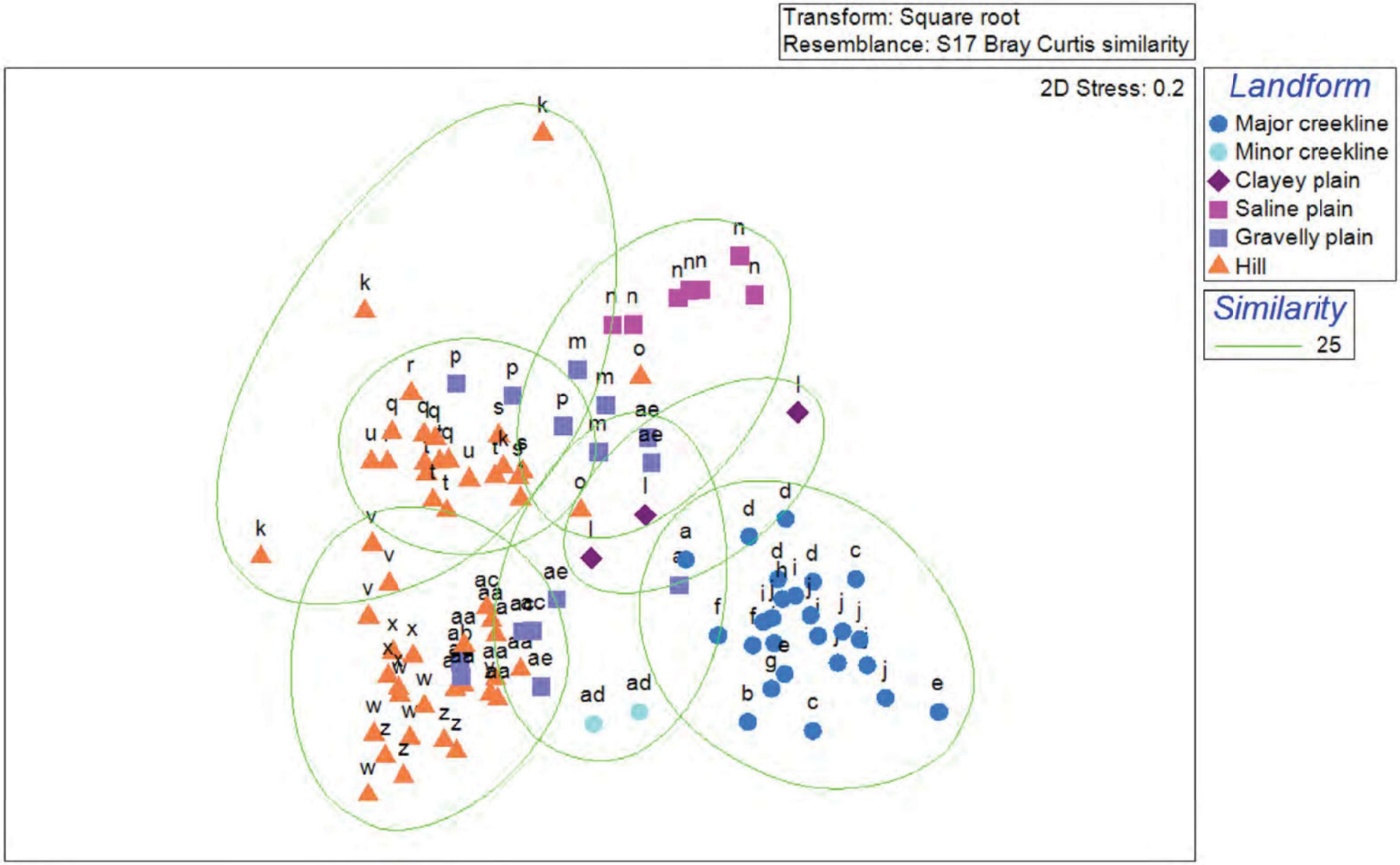


Figure 5: NMDS plot based on percent cover of all species at each site sampled during the current survey work (symbols indicate habitat; letters indicate floristic group defined by SIMPROF test).

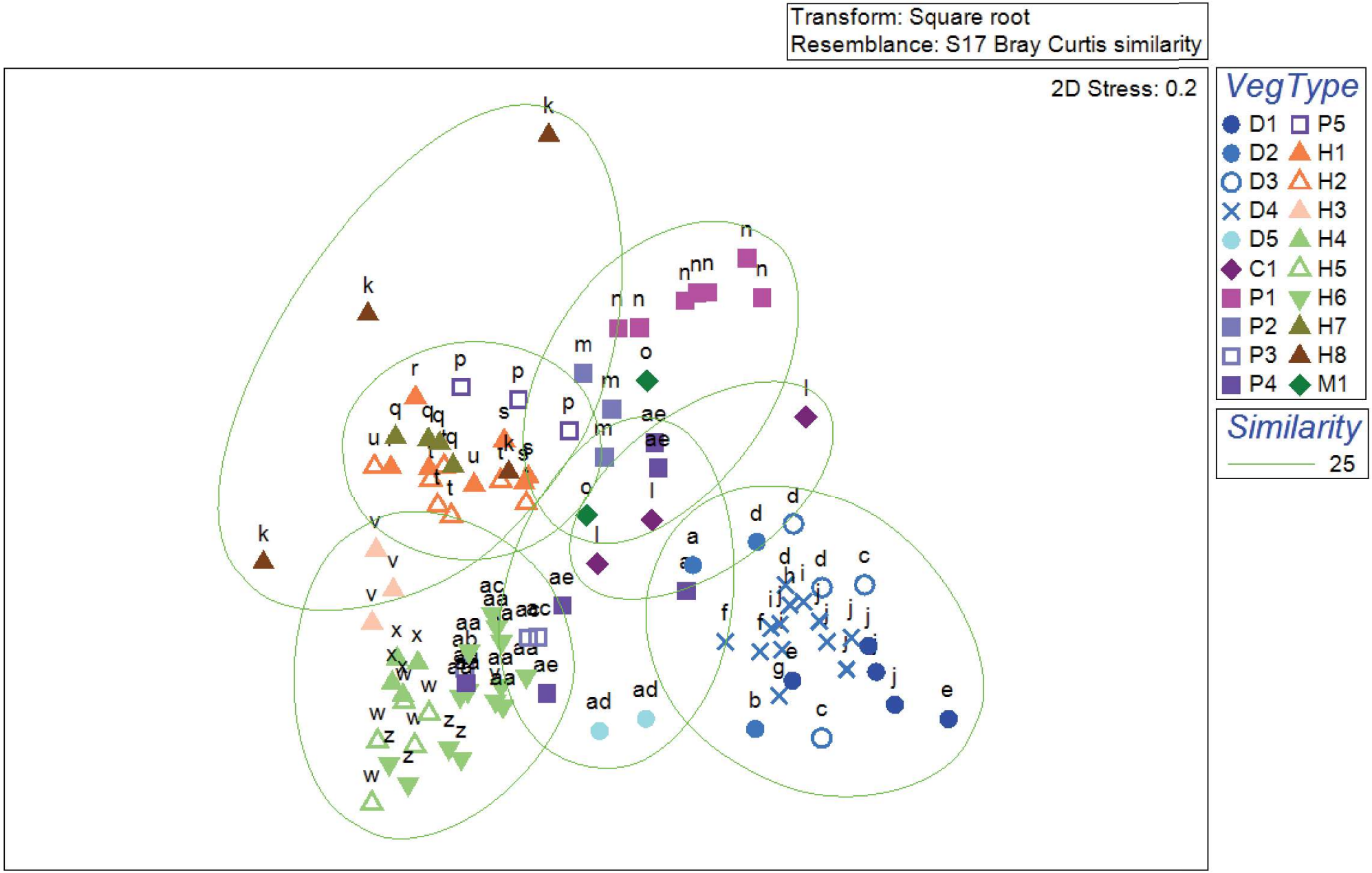
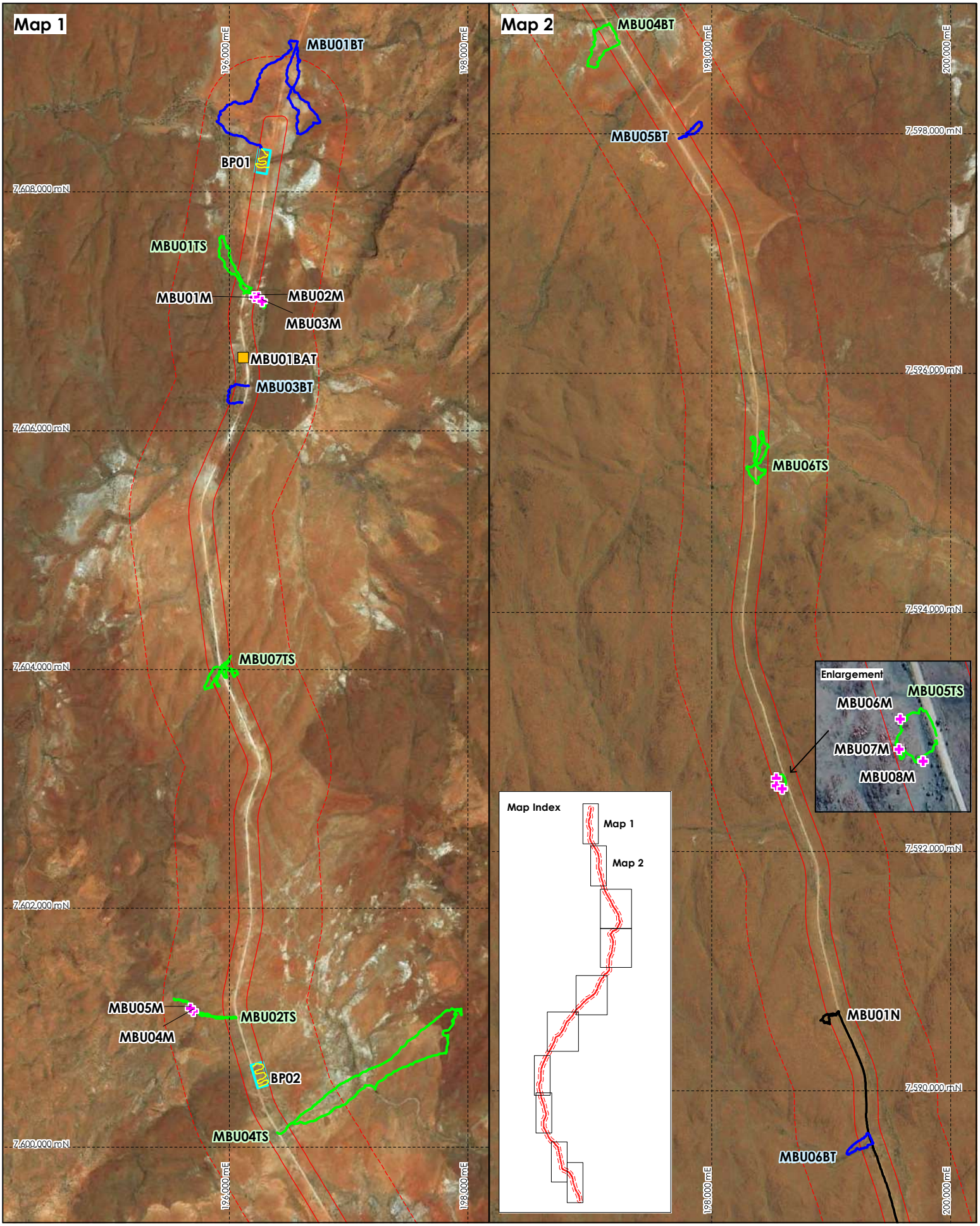


Figure 6: NMDS plot based on percent cover of all species at each site sampled during the current survey work (symbols indicate vegetation unit; letters indicate floristic group defined by SIMPROF test).

Appendix 16

Fauna Sampling Effort



Location Map



Survey area
Contextual area
Bilby plot
Bilby plot search
Bilby transect
Nocturnal search
Targeted search

Motion camera location
Ultrasonic sound recorder

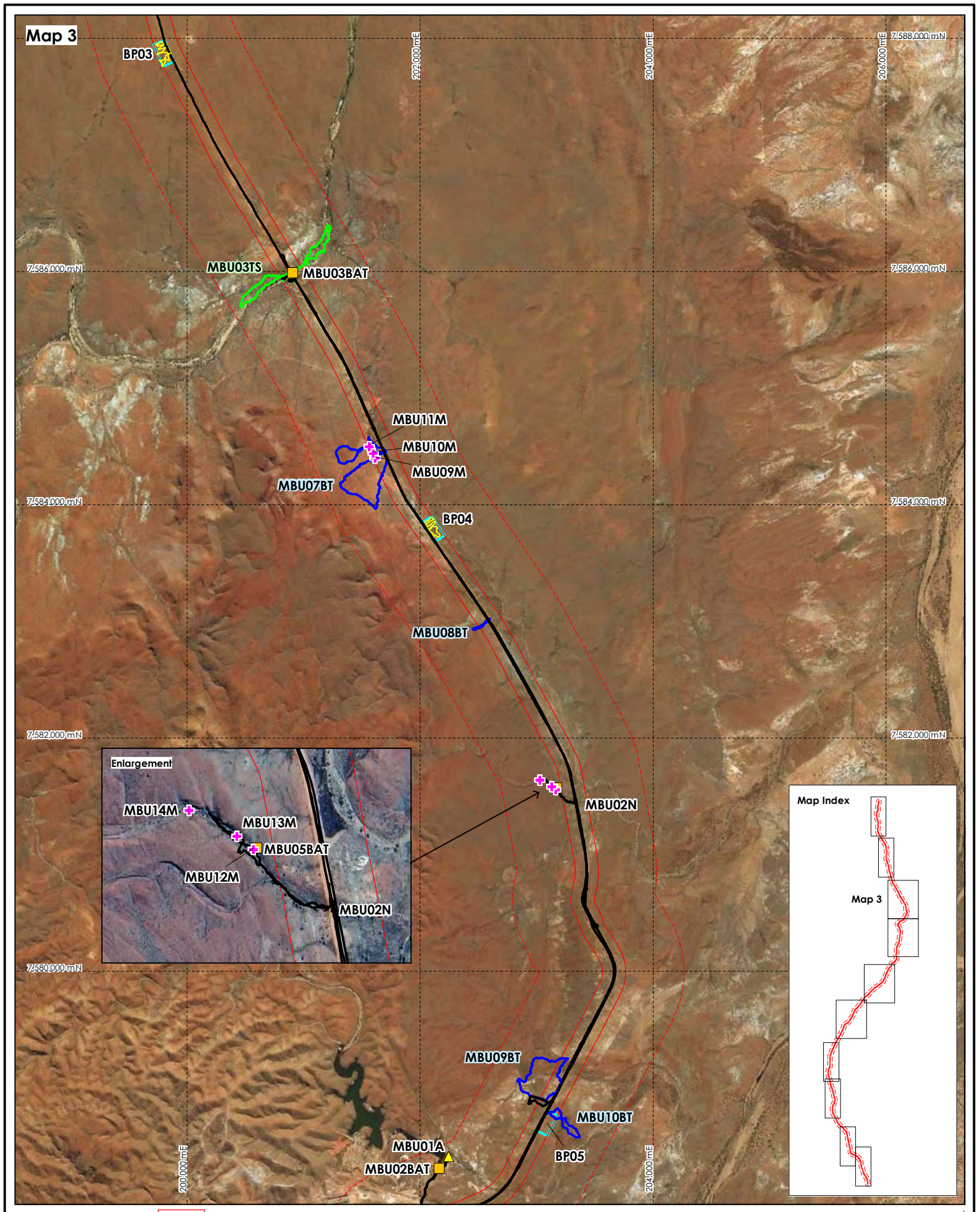
N

0 1 2
kilometres

Marble Bar Road Upgrade
Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA
Map Area
KALGOORLIE
PERTH

Survey area
Contextual area
Bilby plot
Bilby plot search
Bilby transect
Nocturnal search
Targeted search

Audible sound recorder
Motion camera location
Ultrasonic sound recorder

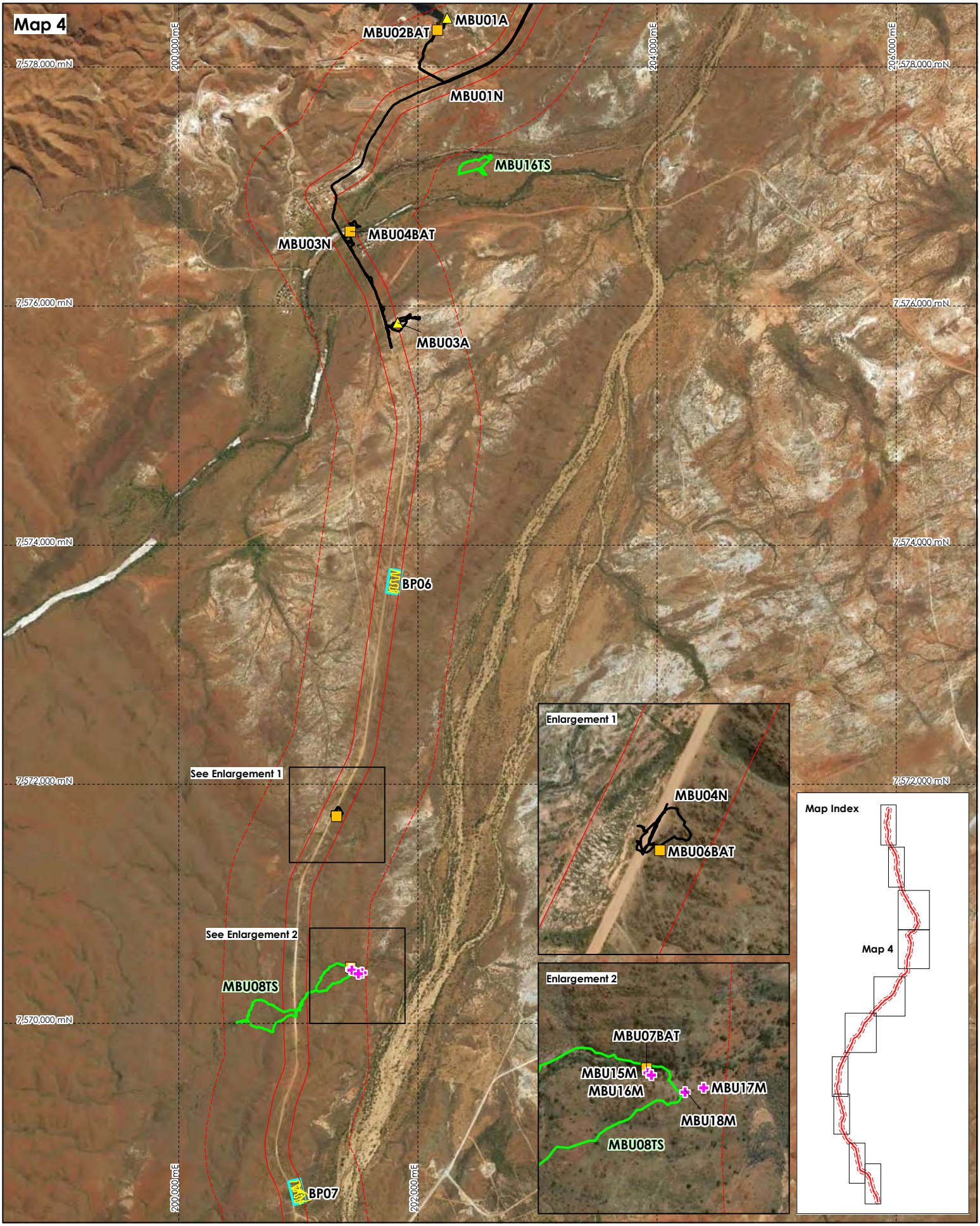
N

0 1 2
kilometres

Marble Bar Road Upgrade
Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby plot

Bilby plot search

Nocturnal search

Targeted search

Audible sound recorder

Motion camera location

Ultrasonic sound recorder

N

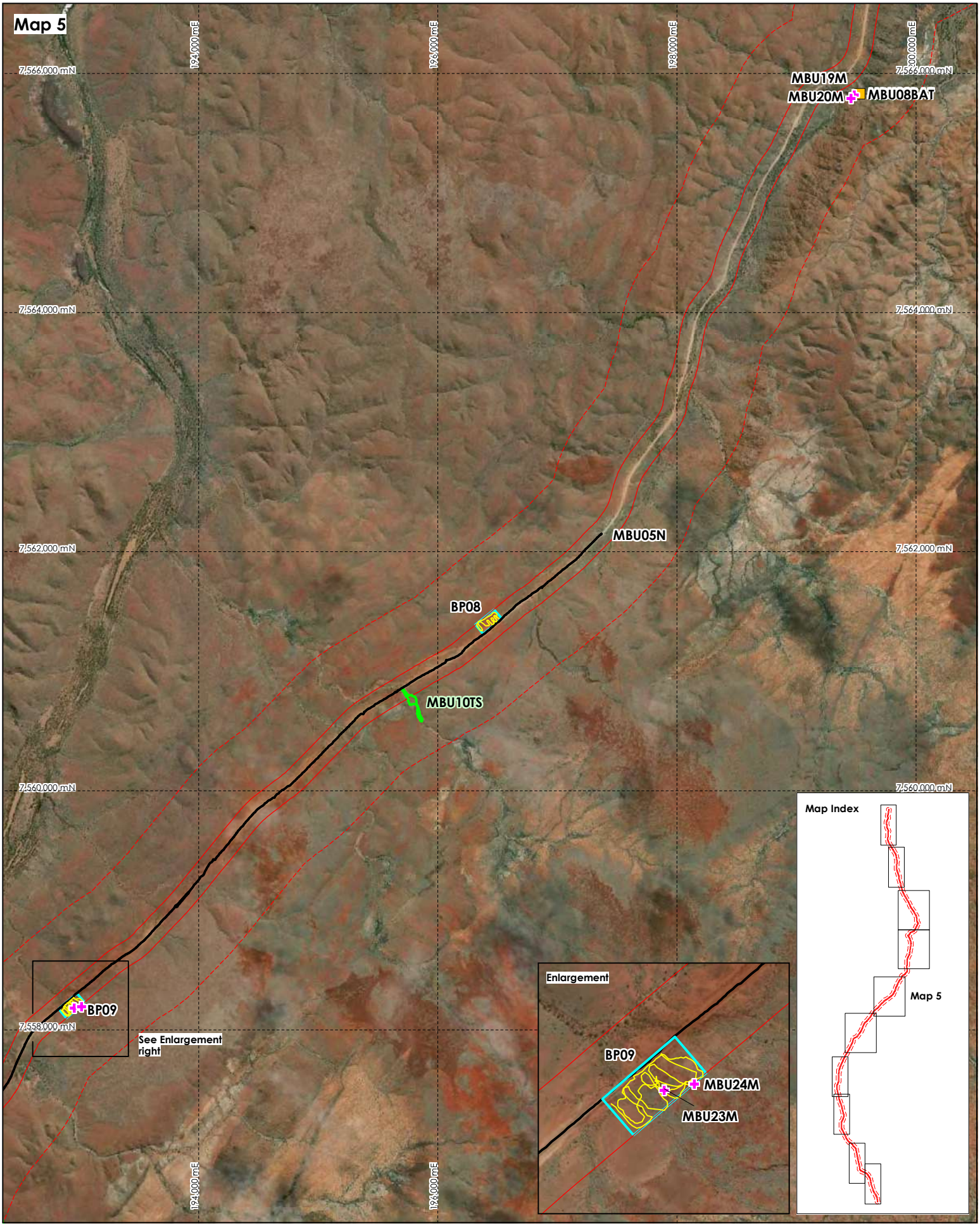
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map



- Survey area
- Contextual area
- Bilby plot
- Bilby plot search
- Nocturnal search
- Targeted search
- Motion camera location
- Ultrasonic sound recorder

N

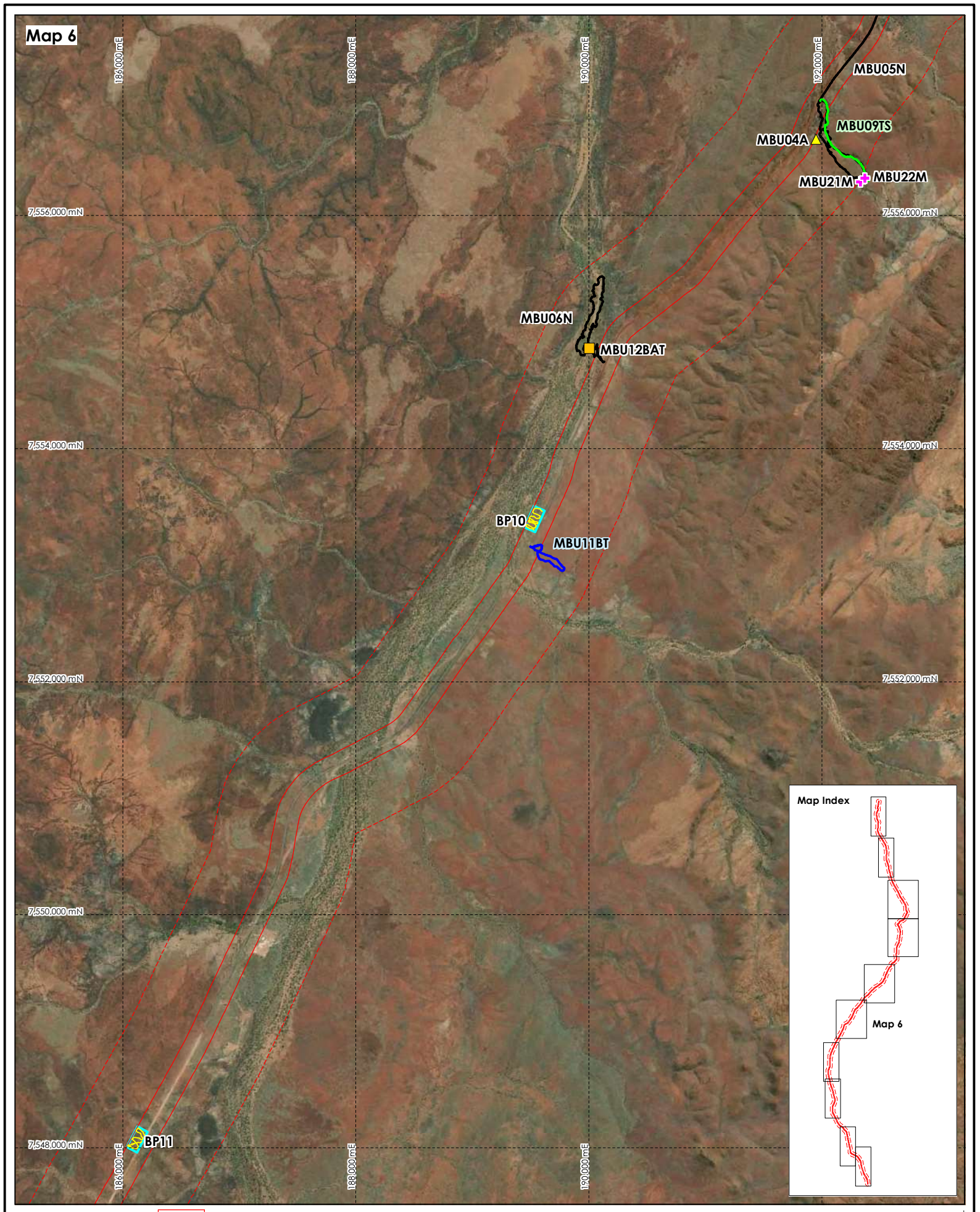
0 1 2

kilometres

Marble Bar Road Upgrade Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map



- Survey area
- Contextual area
- Bilby plot
- Bilby plot search
- Bilby transect
- Nocturnal search
- Targeted search

- Audible sound recorder
- Motion camera location
- Ultrasonic sound recorder

N

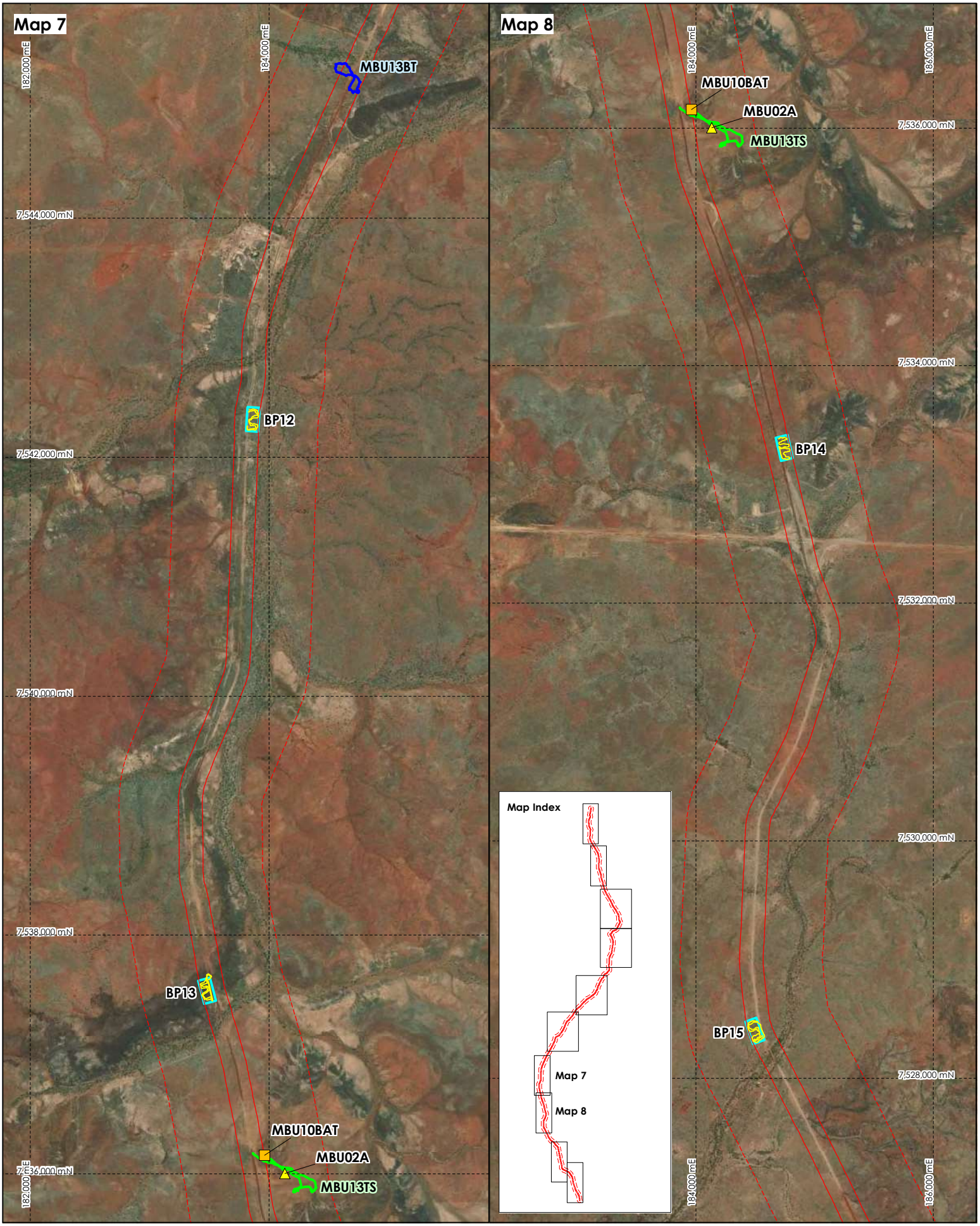
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map



Survey area
Contextual area
Bilby plot
Bilby plot search
Bilby transect
Targeted search

Audible sound recorder
Ultrasonic sound recorder

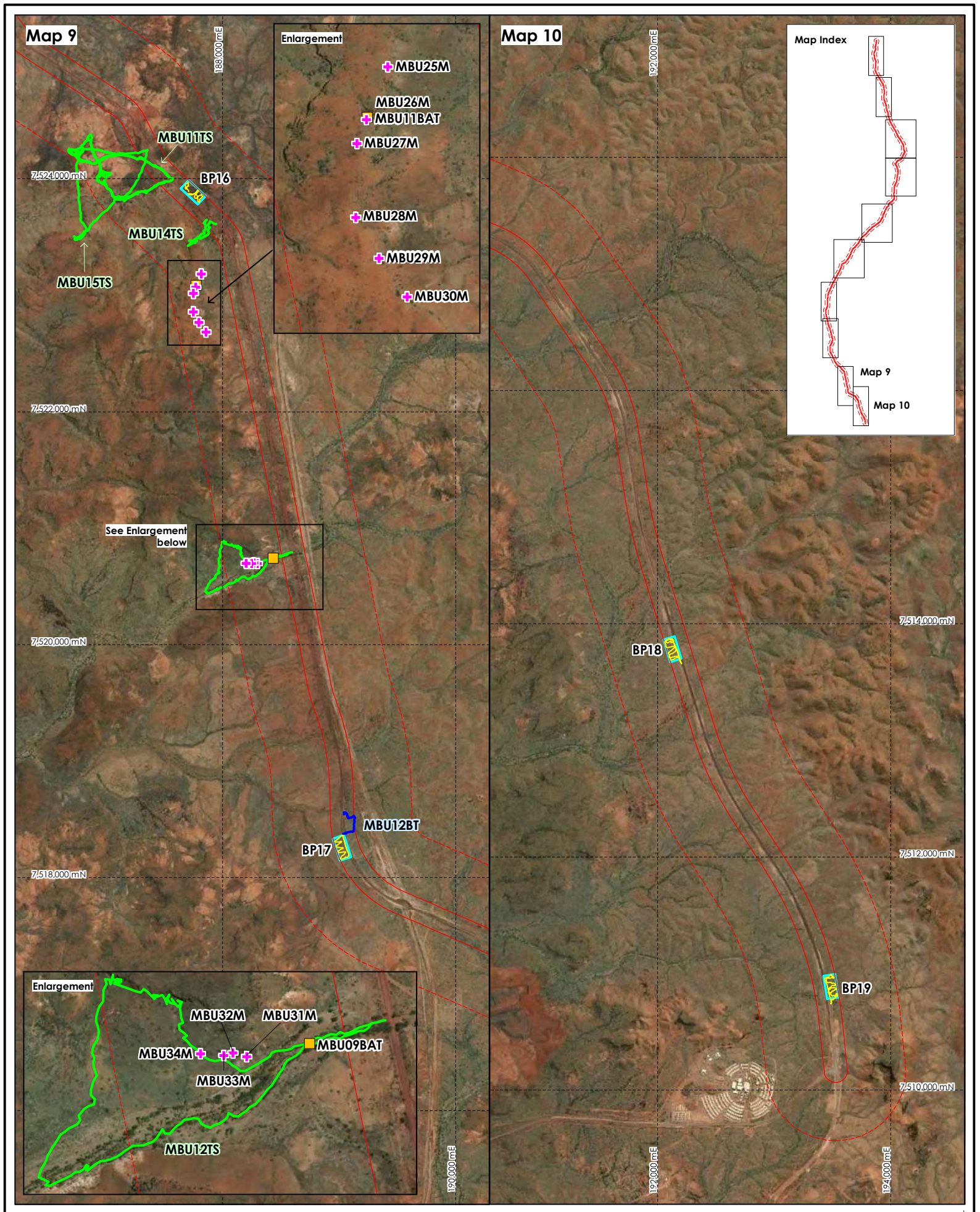
N

0 1 2
kilometres

Marble Bar Road Upgrade Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map



Survey area
Contextual area
Bilby plot
Bilby plot search
Bilby transect
Targeted search

Motion camera location
Ultrasonic sound recorder

N

0 1 2
kilometres

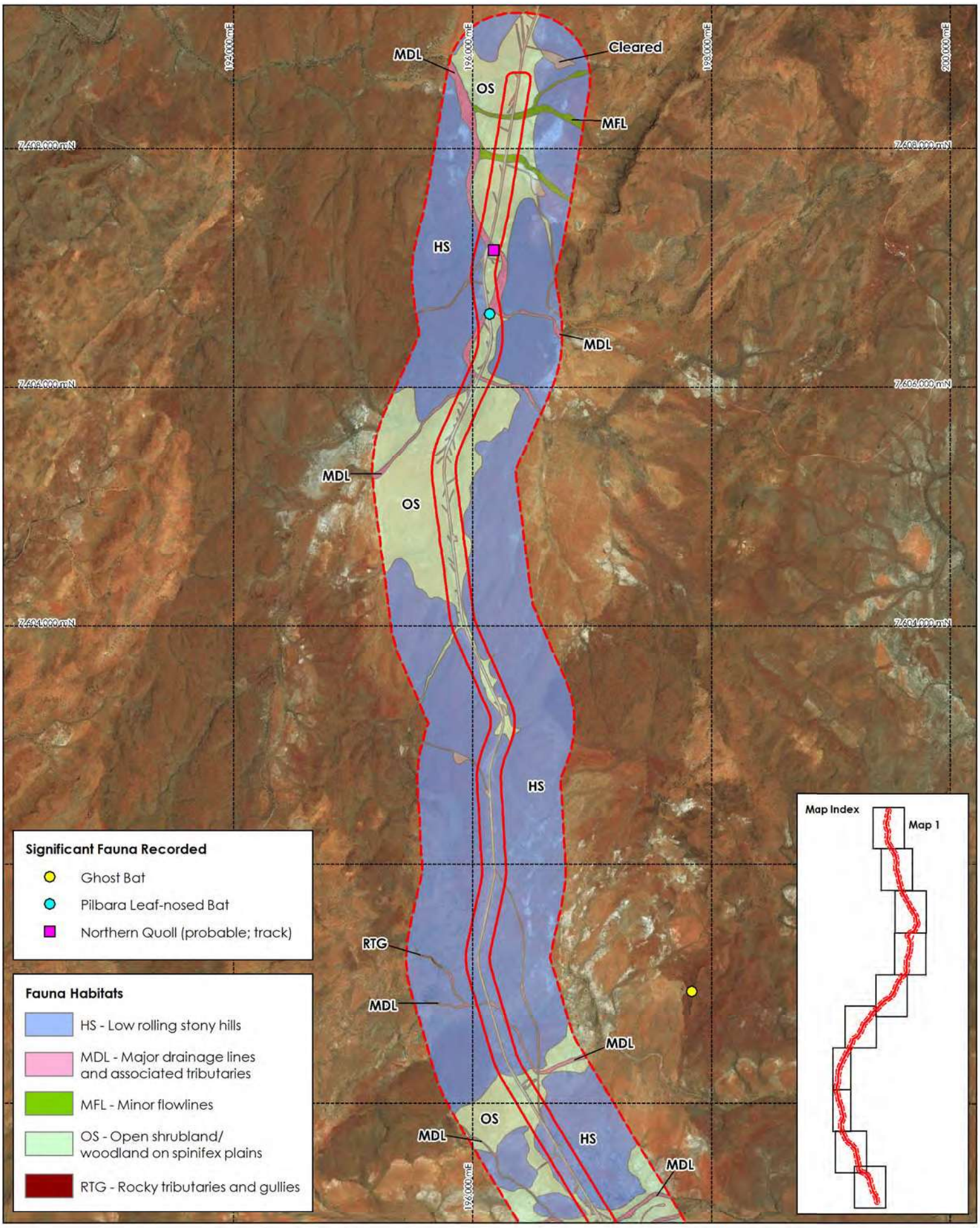
Marble Bar Road Upgrade
Fauna Survey Effort

Biota Environmental Sciences

Author: J Graff | Drawn: M Robinson | Job No.: 1509 | Date: 20 May 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000

Appendix 17

Fauna Habitat Mapping and Locations of Fauna of Conservation Significance



Location Map



Survey area

Contextual area

N

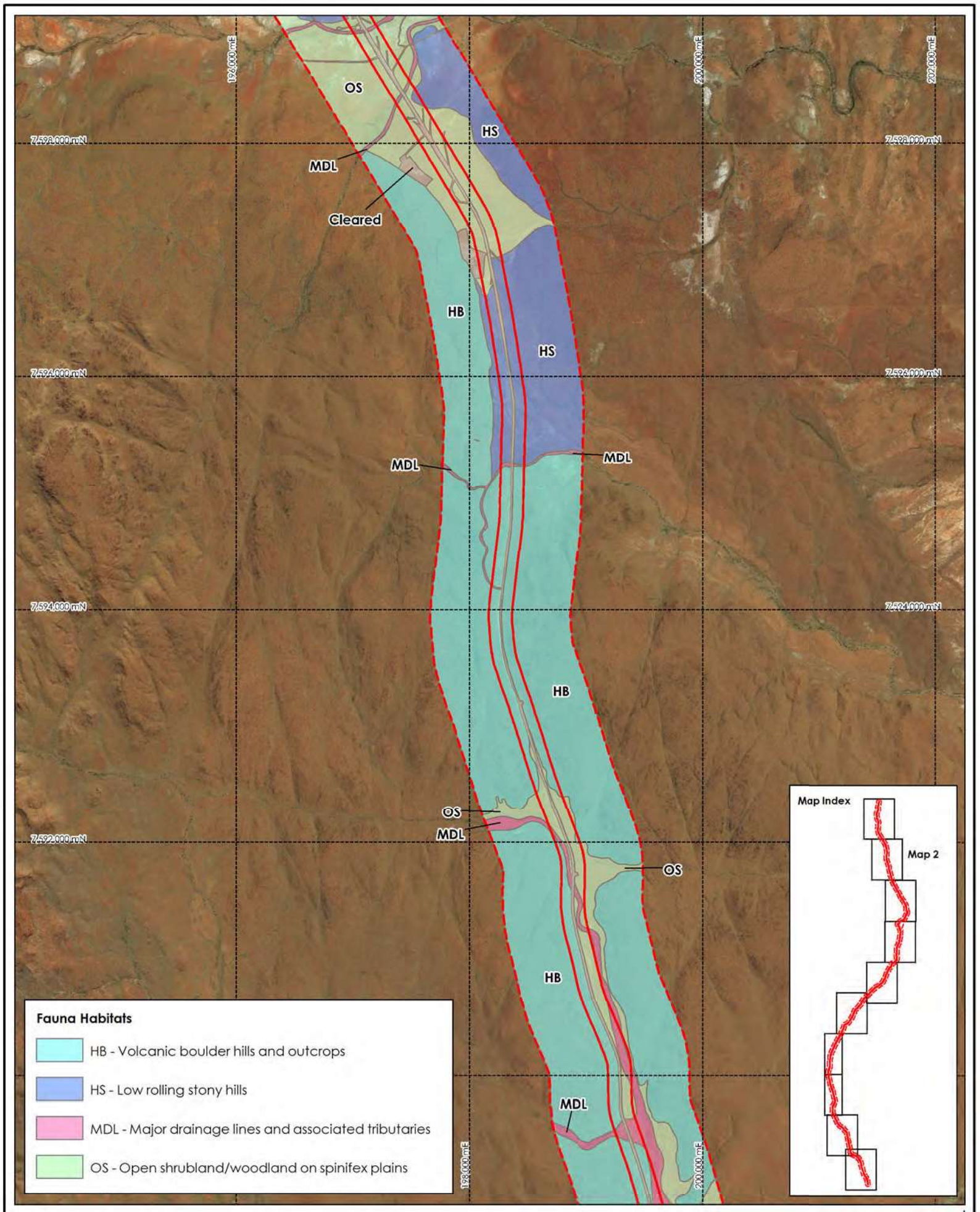
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 1

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 04 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map



Survey area

Contextual area

N

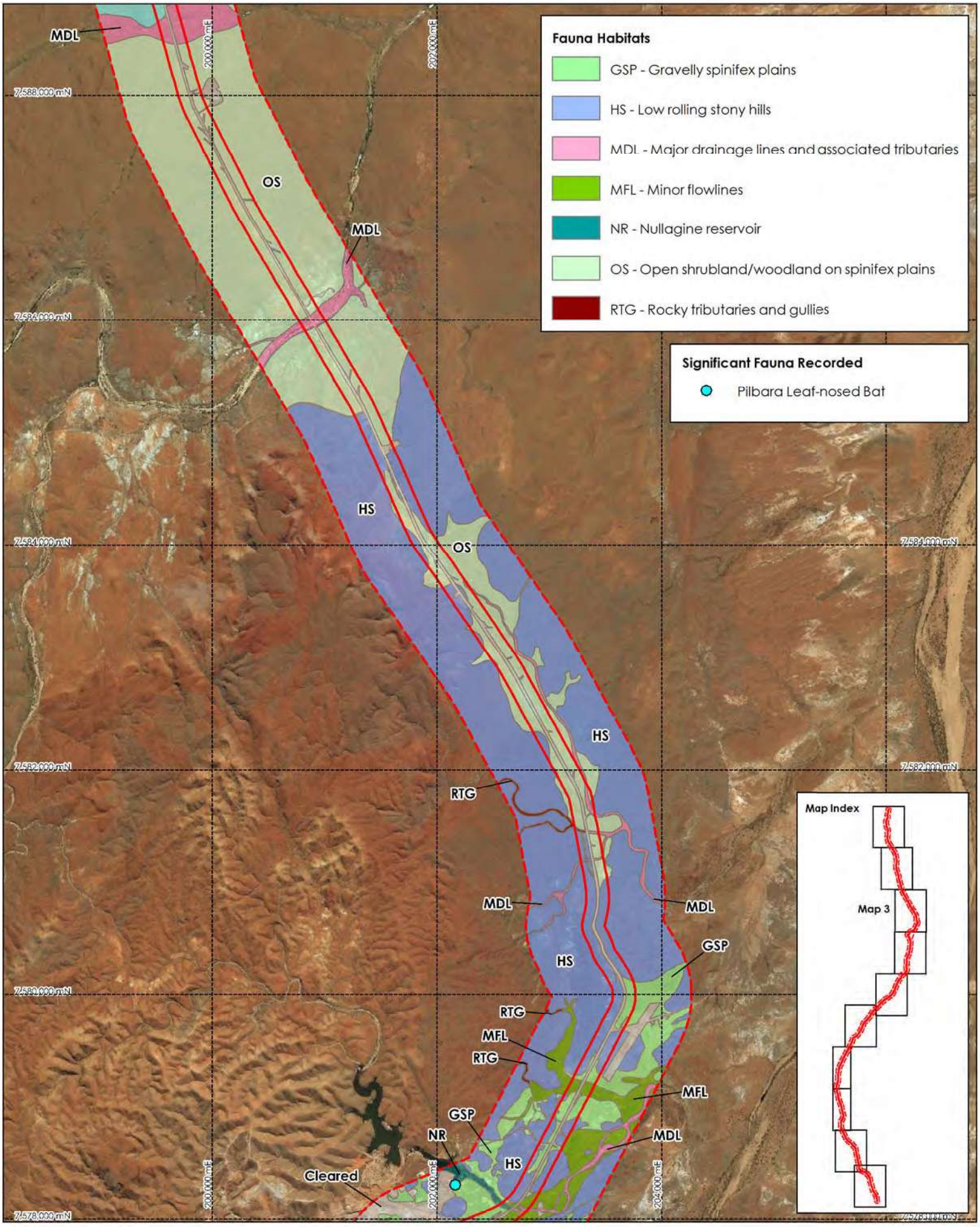
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 2

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 04 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

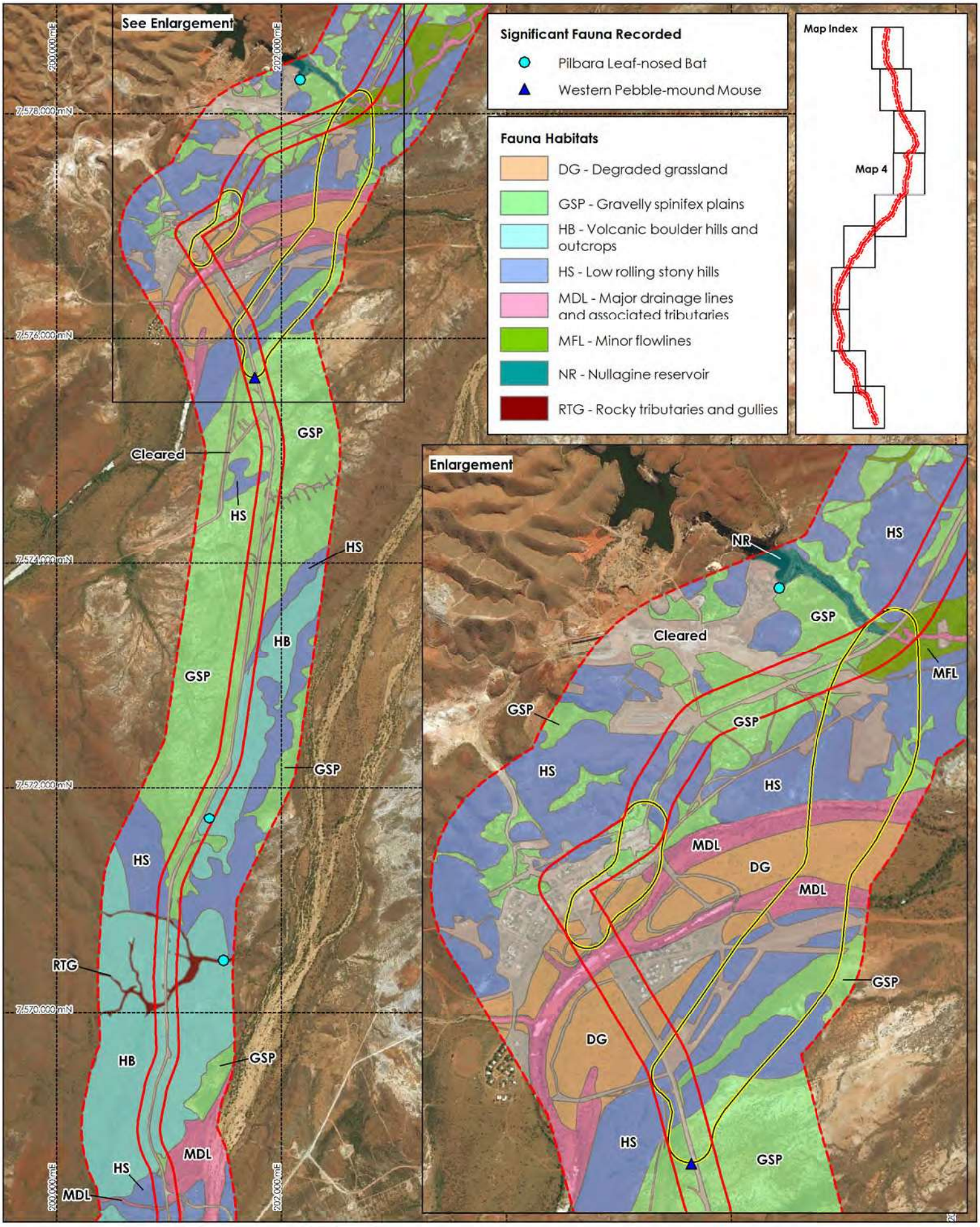
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 3

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 04 Nov 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Nullagine bypass survey area

N

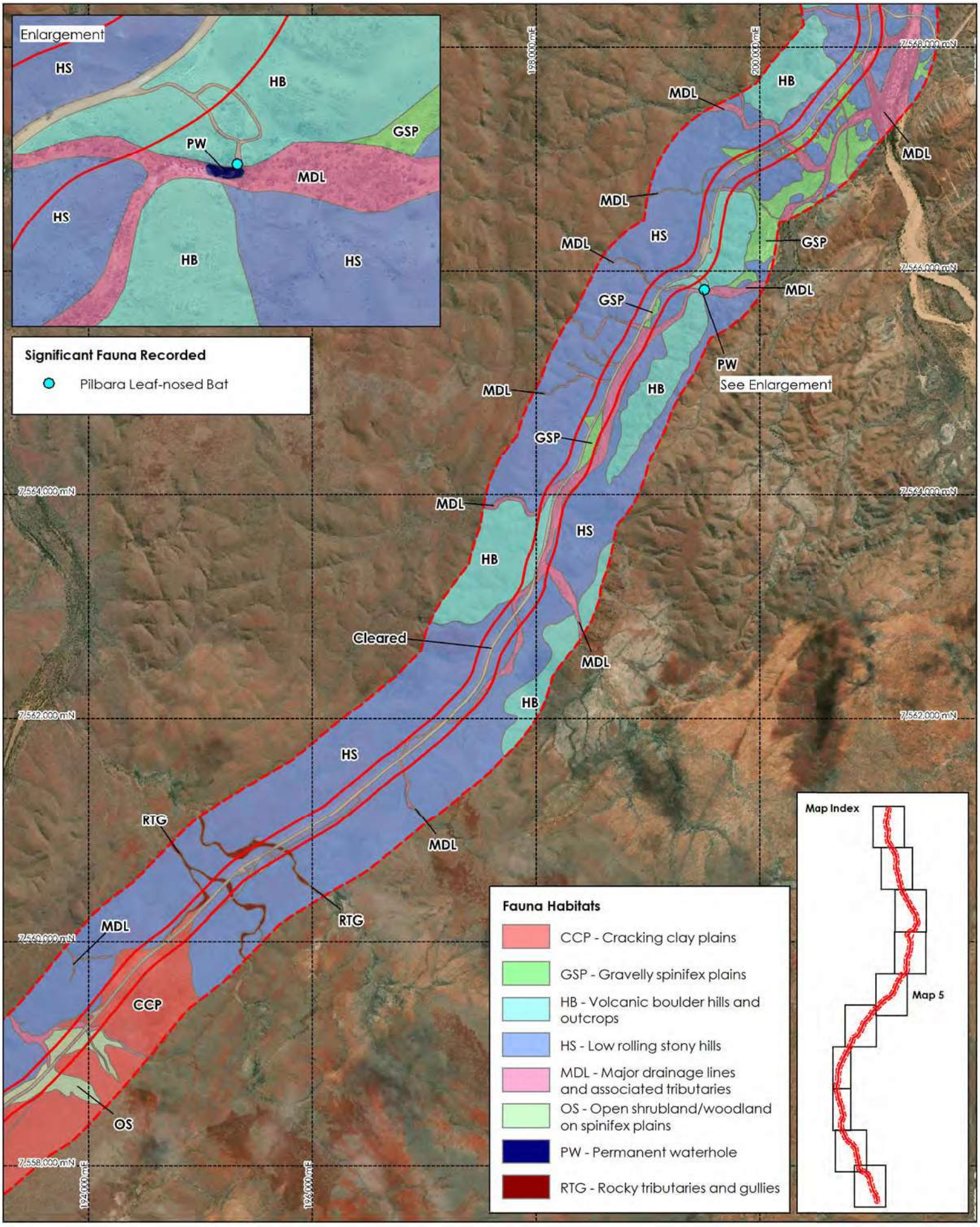
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 4

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 04 Nov 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

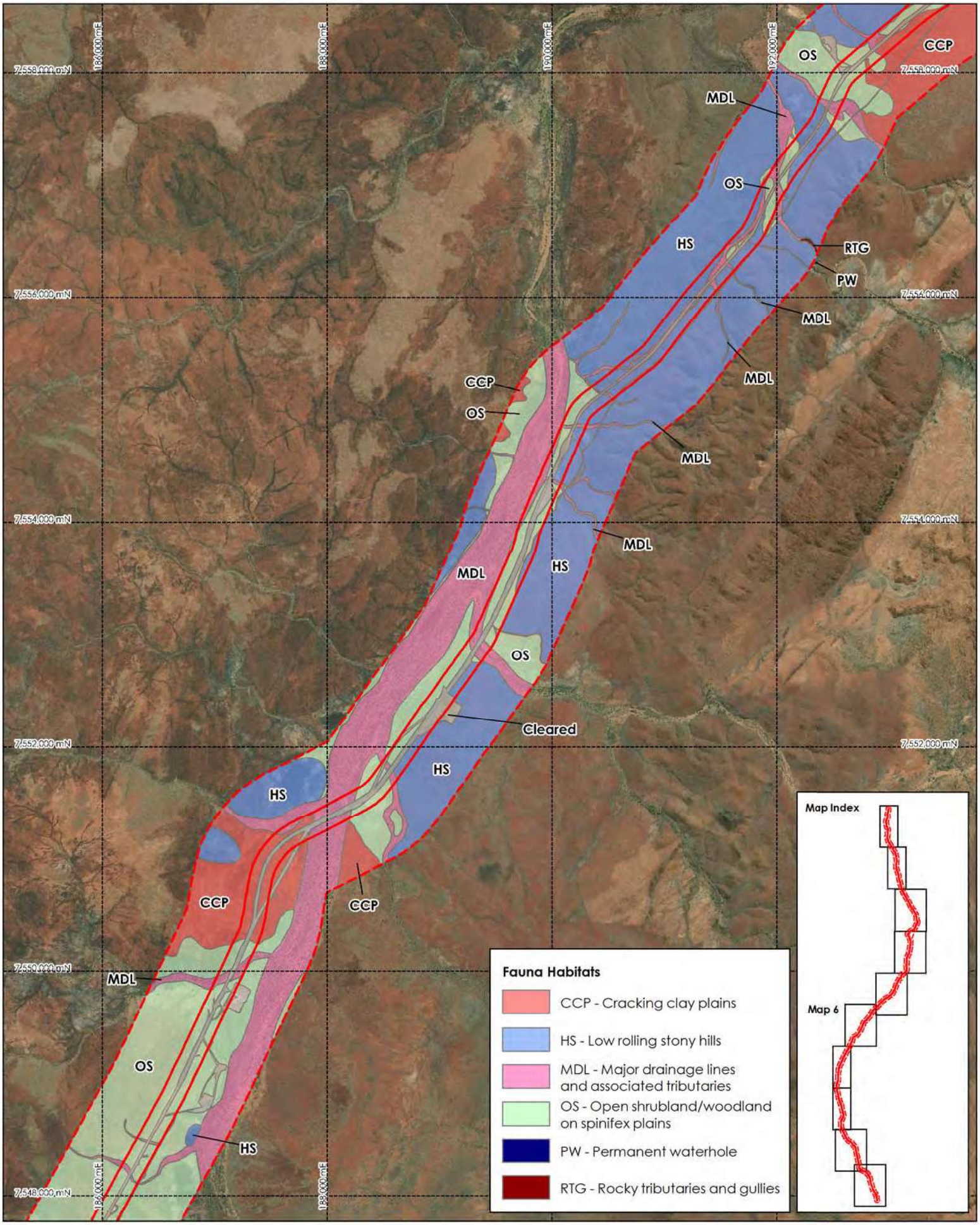
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 5

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 04 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500





Survey area

Contextual area

N

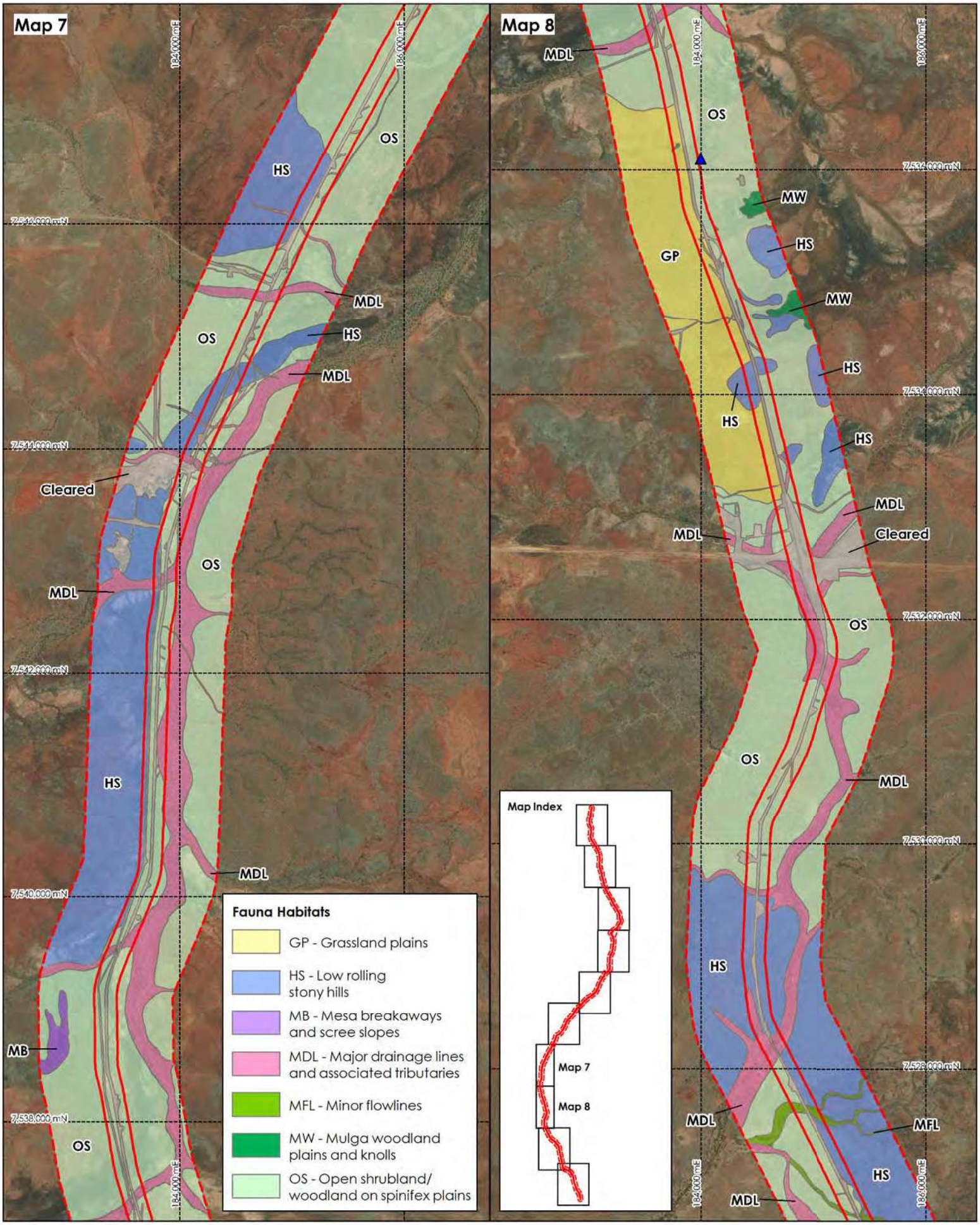
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 6

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 04 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map



Survey area

Contextual area

Significant Fauna Recorded

▲ Western Pebble-mound Mouse

N

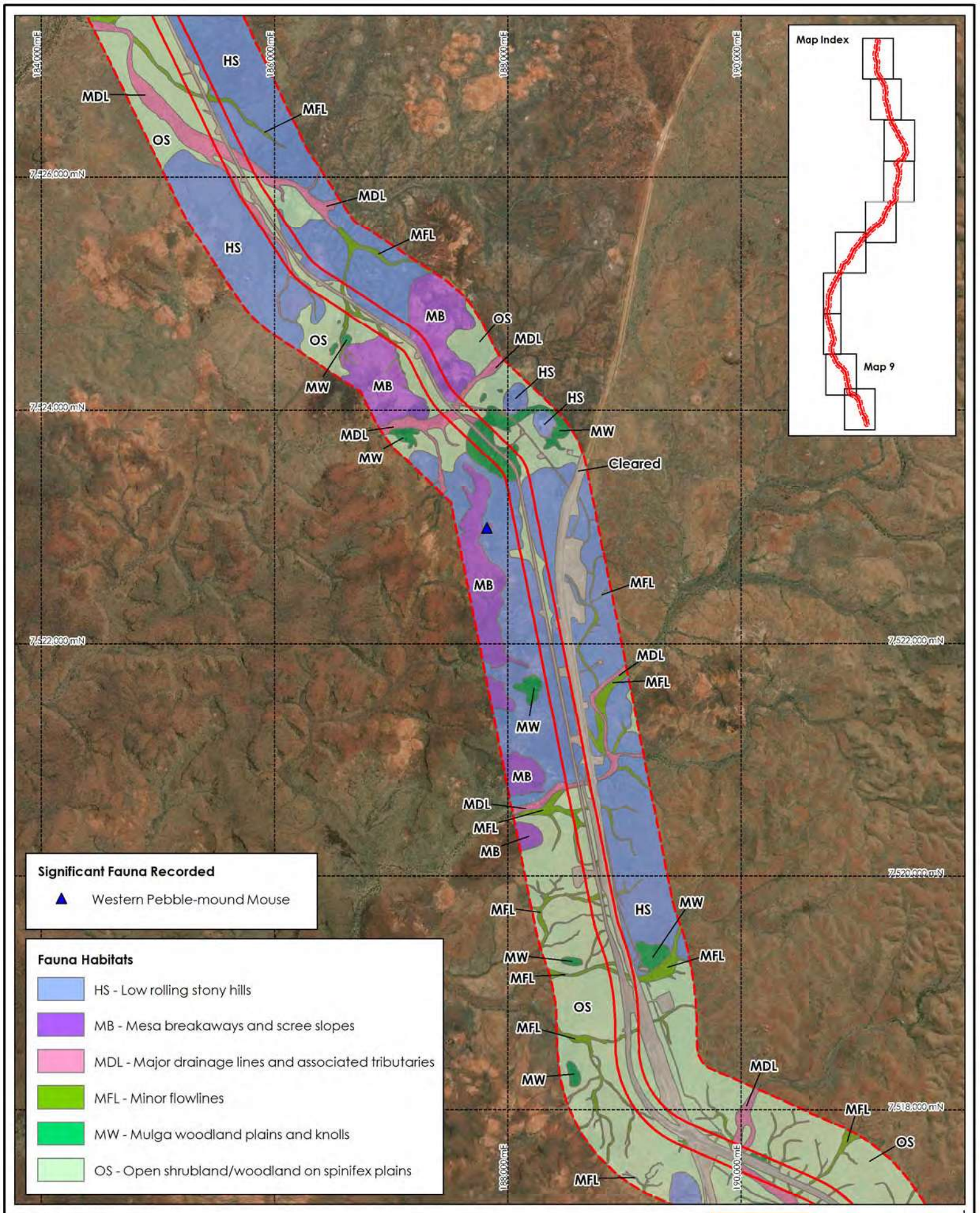
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Maps 7 & 8

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 04 Nov 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

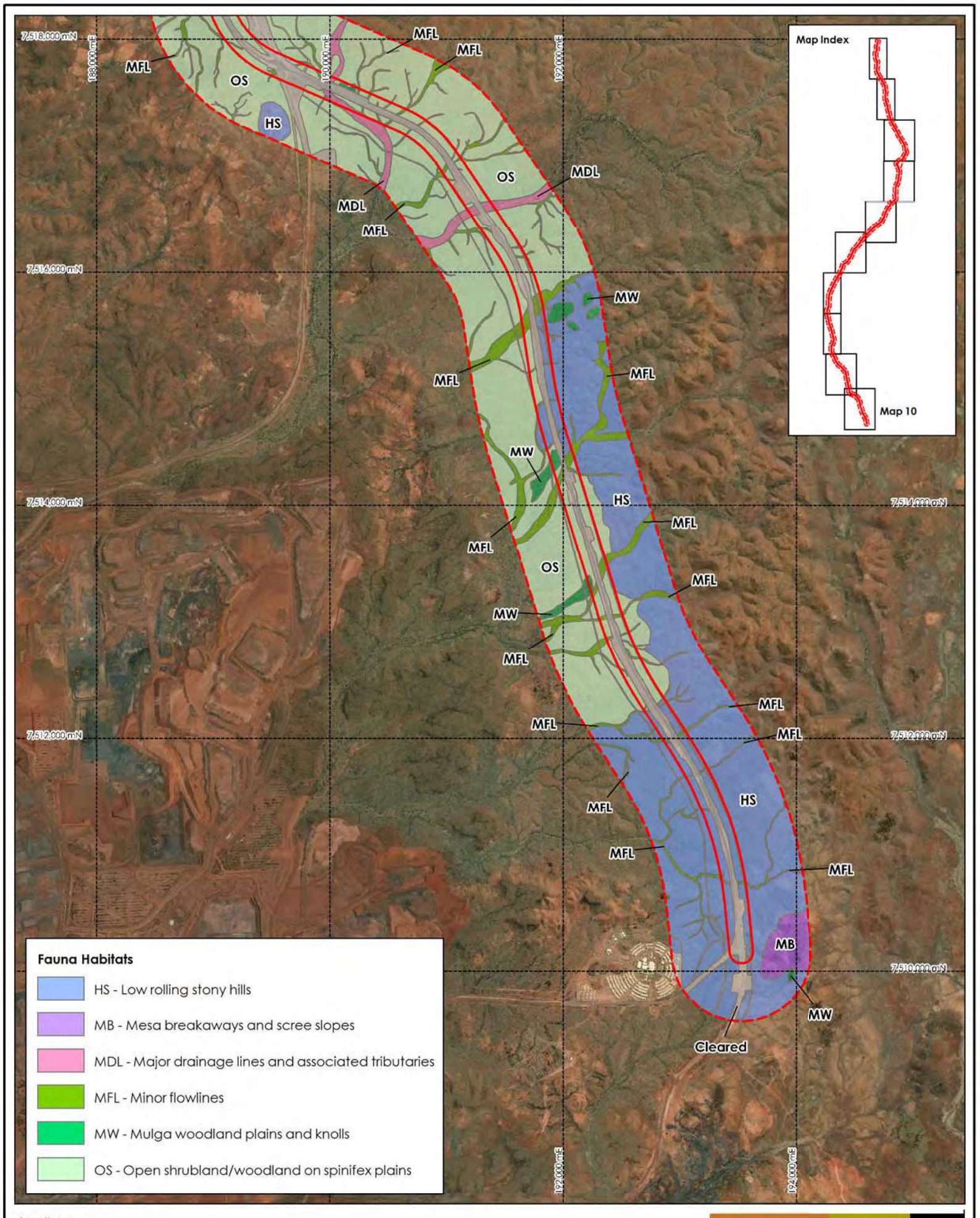
0 1 2

kilometres

Marble Bar Road Upgrade
Fauna Habitat Map 9

Biota Environmental Sciences

Author: M Maier | Drawn: M Robinson | Job No.: 1509 | Date: 04 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Fauna Habitats

- HS - Low rolling stony hills
- MB - Mesa breakaways and scree slopes
- MDL - Major drainage lines and associated tributaries
- MFL - Minor flowlines
- MW - Mulga woodland plains and knolls
- OS - Open shrubland/woodland on spinifex plains

Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

N

0 1 2

kilometres

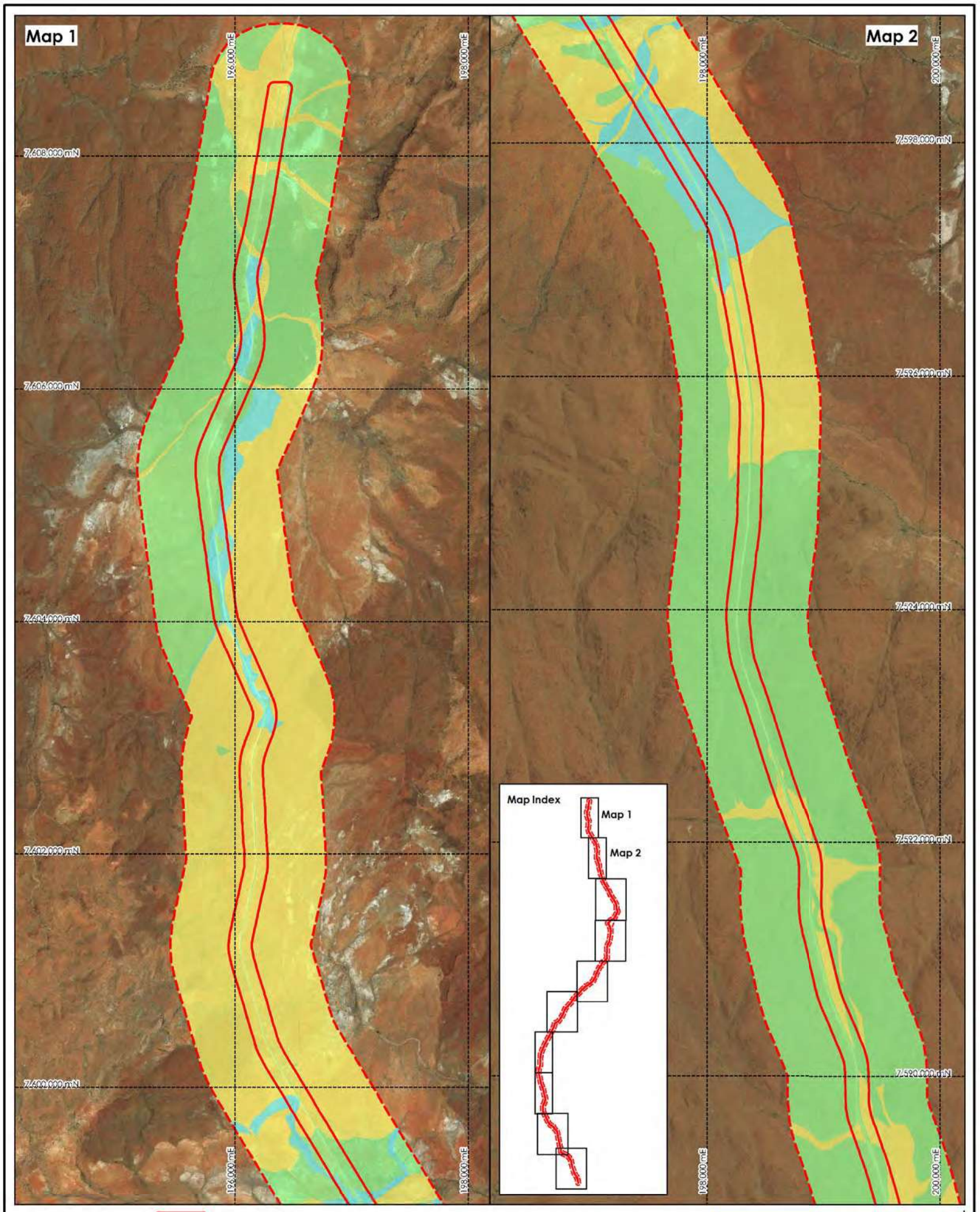
Marble Bar Road Upgrade
Fauna Habitat Map 10

Biota Environmental Sciences

Author: M Maier	Drawn: M Robinson	Job No.: 1509	Date: 04 Nov 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:40,000

Appendix 18

Bilby Habitat Mapping



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

High

Moderate

Low

N

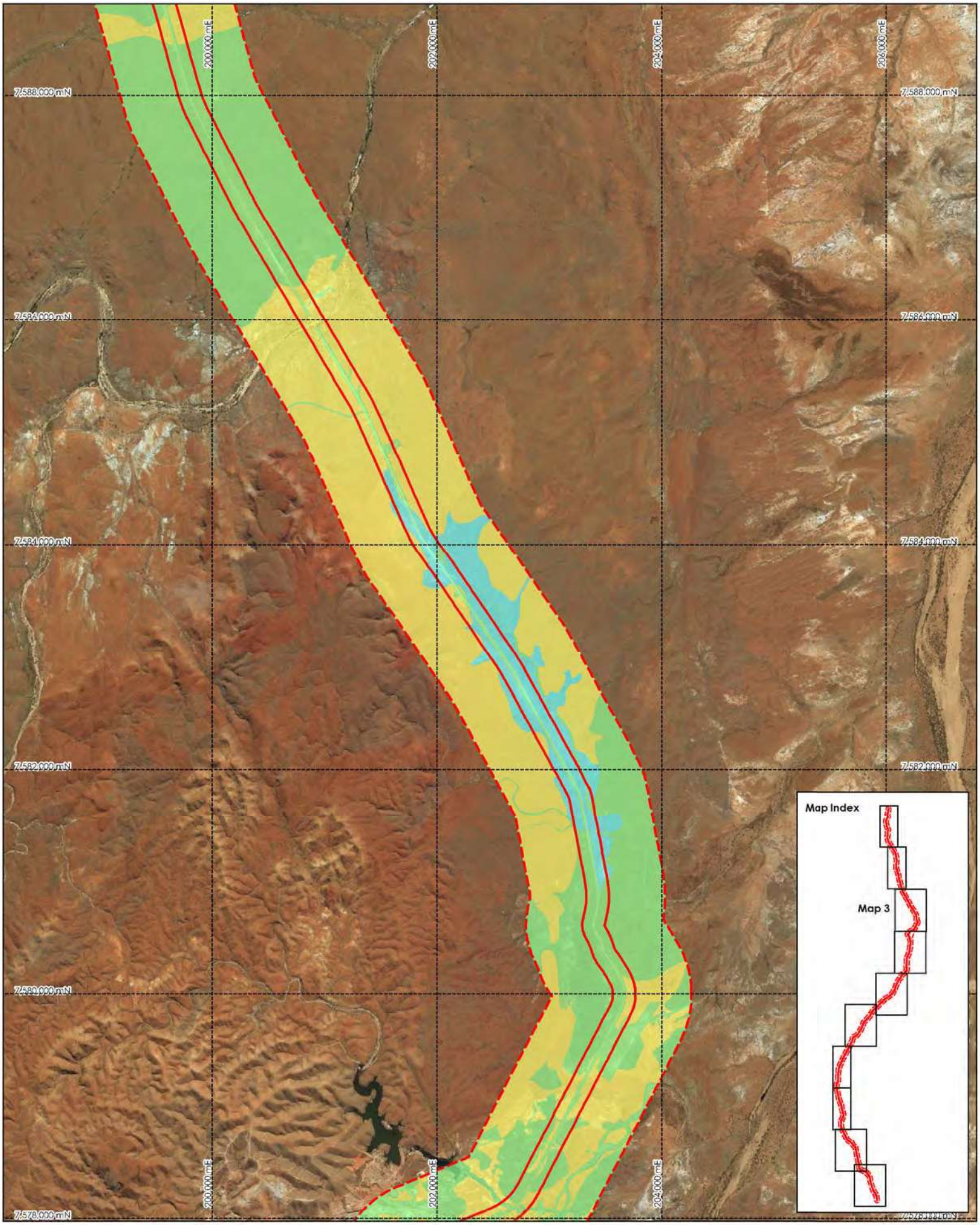
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Maps 1 & 2

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

High

Moderate

Low

N

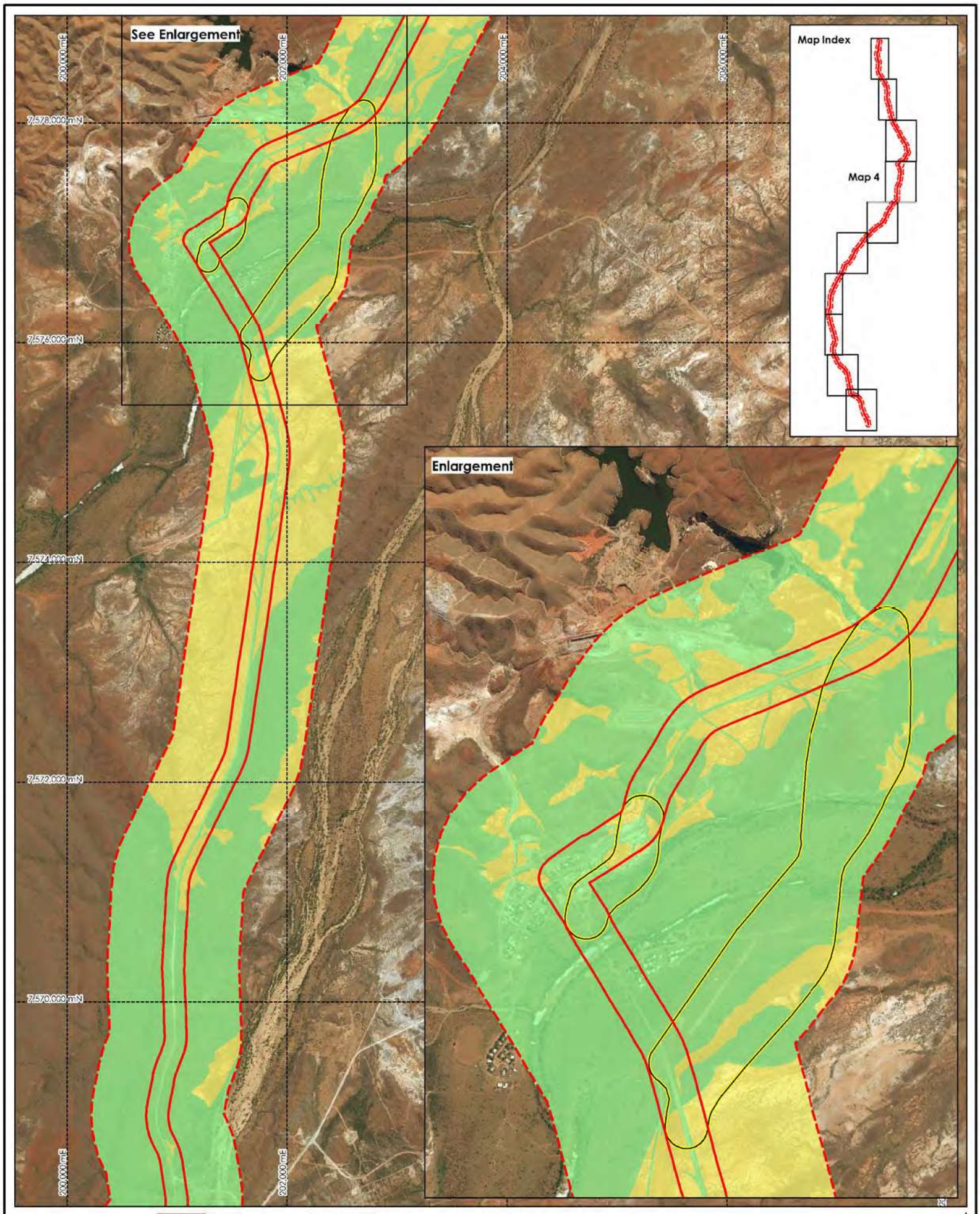
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 3

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Nullagine bypass survey area

Bilby Habitat Prospectivity

Moderate

Low

N

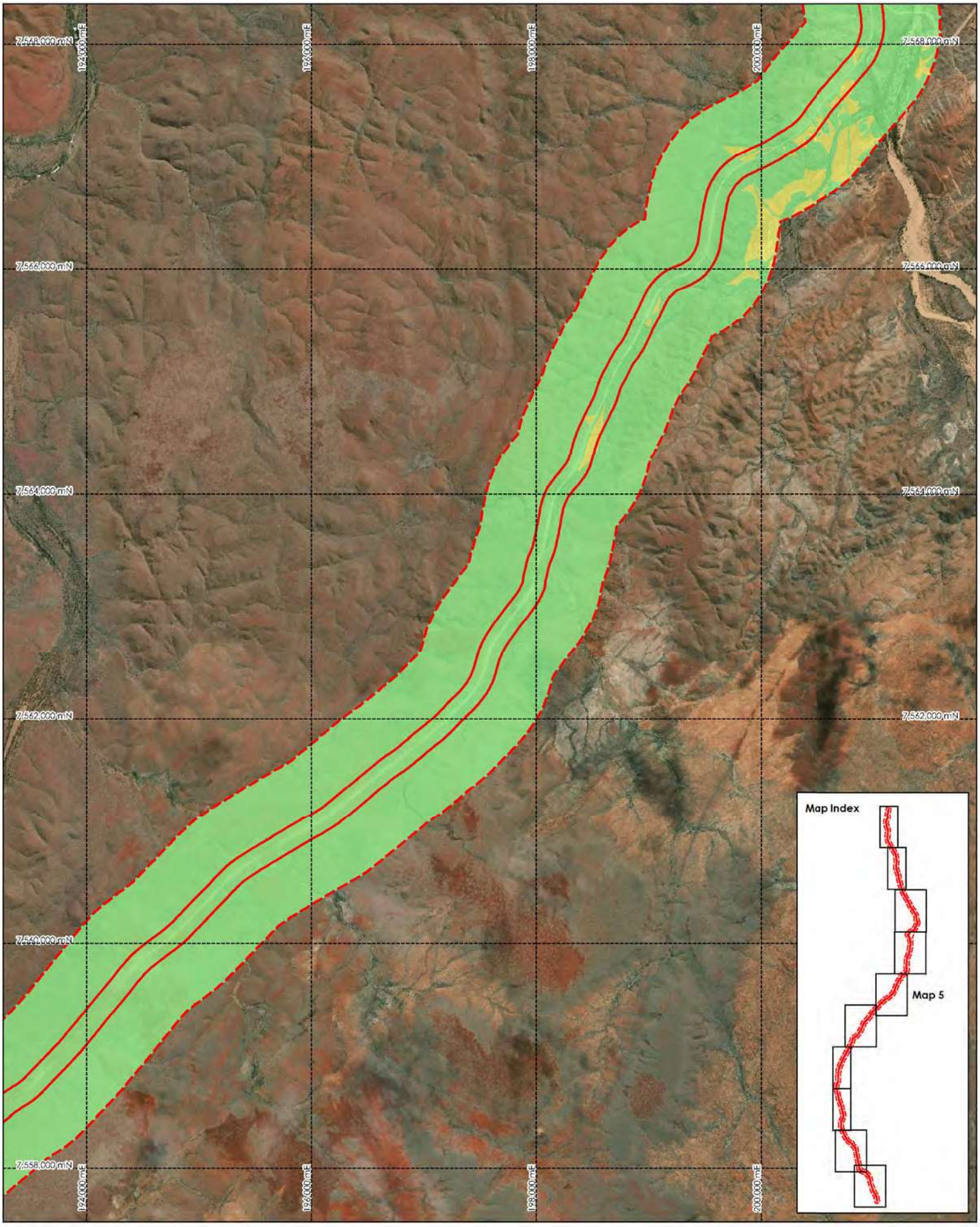
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 4

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

Moderate

Low

N

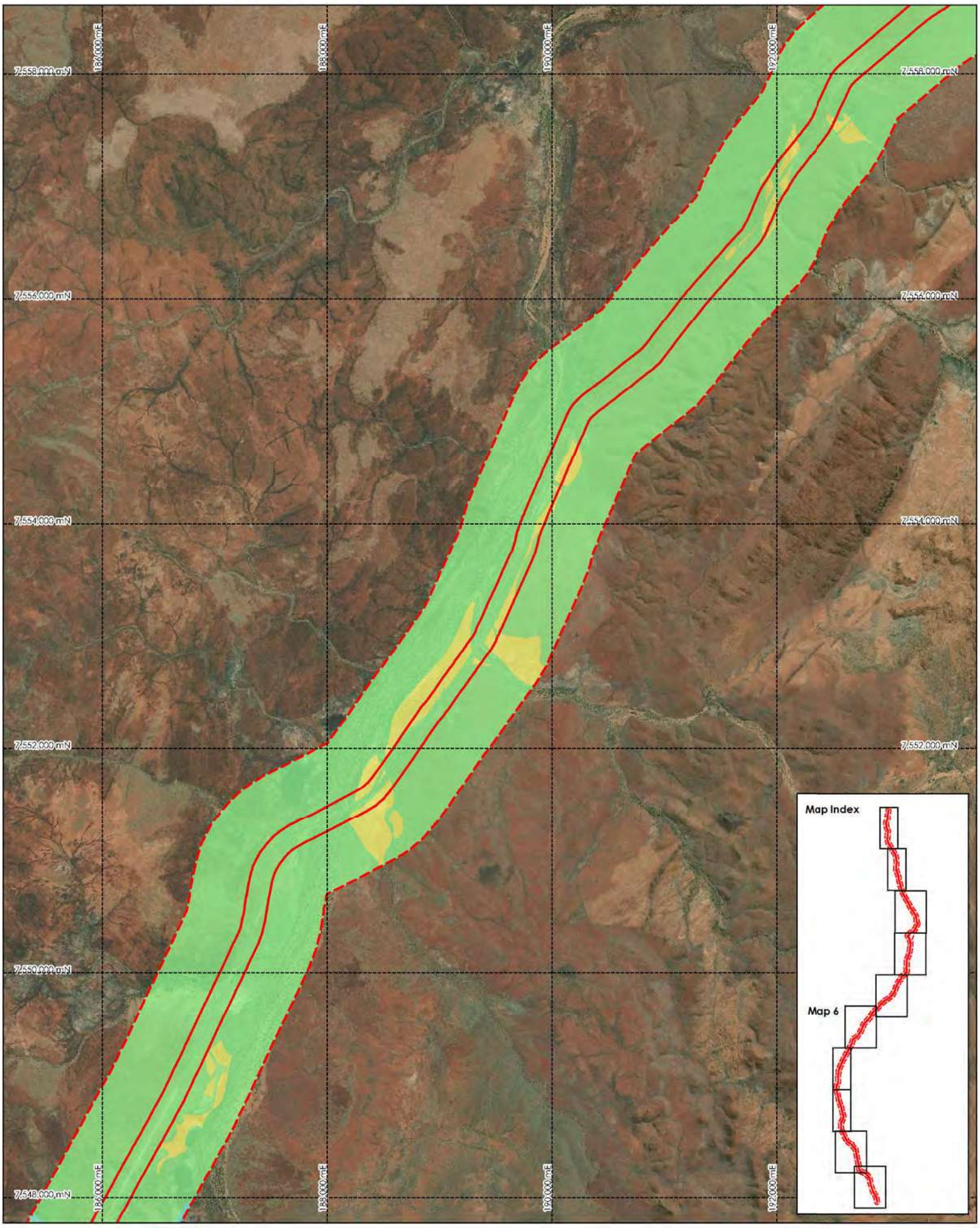
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 5

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

High

Moderate

Low

N

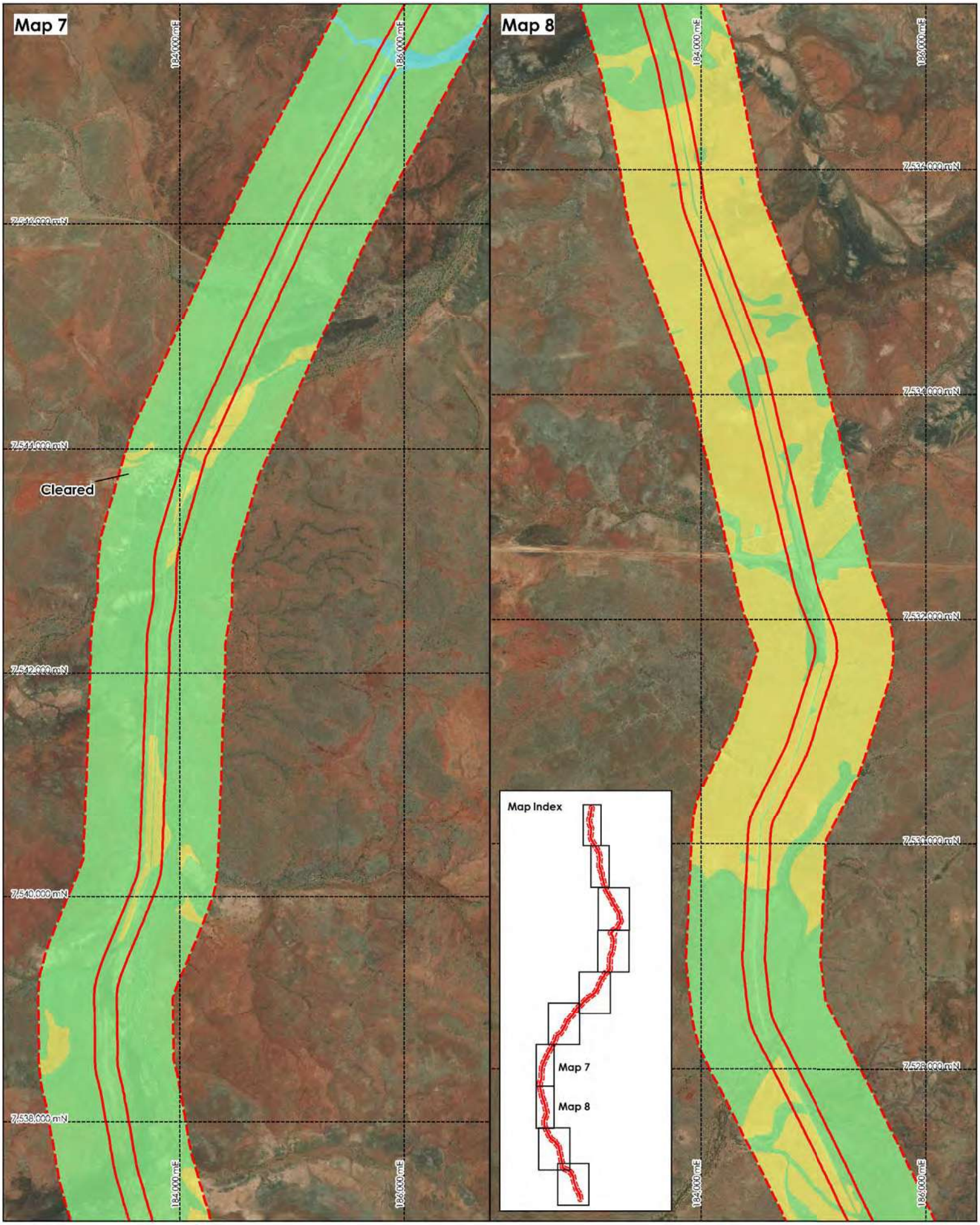
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 6

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

High

Moderate

Low

N

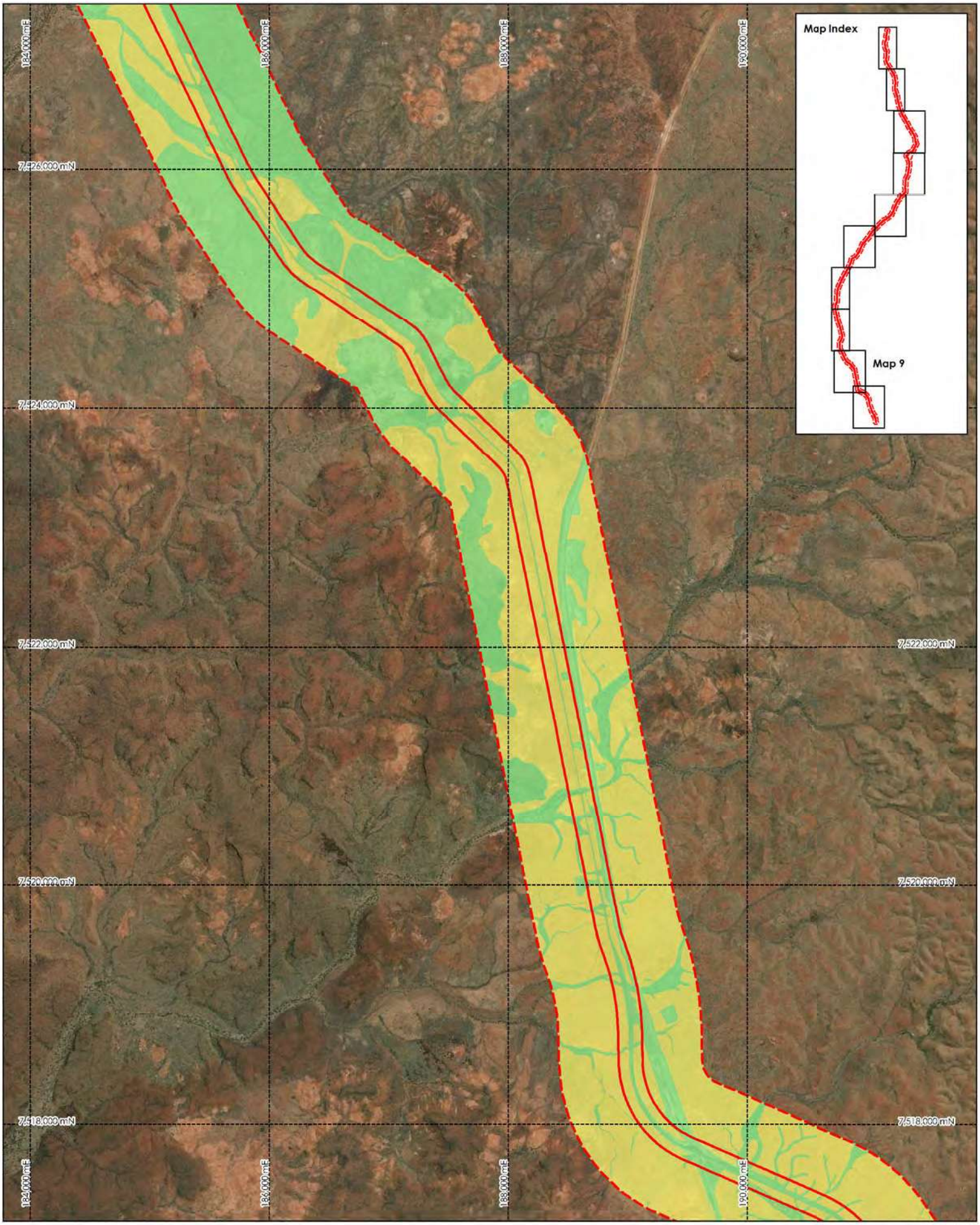
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Maps 7 & 8

Biota Environmental Sciences

Author: P Brooshooft	Drawn: M Robinson	Job No.: 1509	Date: 09 Nov 2020	Revised:	Projection: MGA Z51 (GDA94)	Scale: 1:42,500



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

Moderate

Low

N

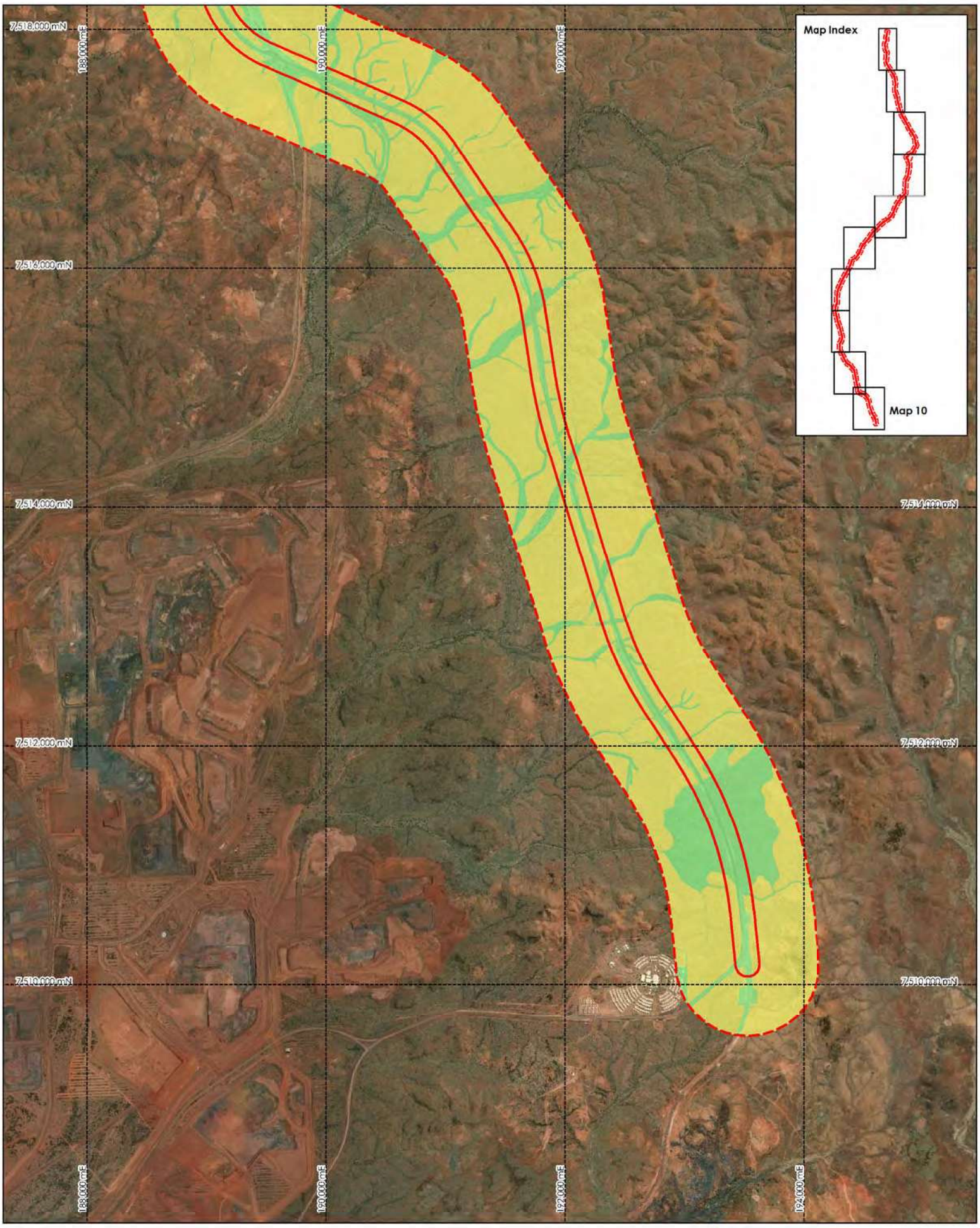
0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 9

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000



Location Map

KARRATHA

Map Area

KALGOORLIE

PERTH

Survey area

Contextual area

Bilby Habitat Prospectivity

Moderate

Low

N

0 1 2

kilometres

Marble Bar Road Upgrade
Bilby Habitat Map 10

Biota Environmental Sciences

Author: P Brooshooft | Drawn: M Robinson | Job No.: 1509 | Date: 09 Nov 2020 | Revised: | Projection: MGA Z51 (GDA94) | Scale: 1:40,000