



Level 1
Flora and Vegetation Survey of the
Proposed Blue Vein Mine
Mt. Holland Operation
(Tenement M77/1065)

Prepared for



FINAL
September 2014

Prepared by:
Native Vegetation Solutions
PO Box 41
KALGOORLIE
Ph: (08) 9022 2536
Mob: 0407 998 953
Email: eren@nativevegsolutions.com.au

| | | |
|-----------|--|-----------|
| 1 | INTRODUCTION..... | 1 |
| 1.1 | OBJECTIVES | 3 |
| 1.2 | GEOLOGY AND VEGETATION | 3 |
| 1.3 | CLIMATE..... | 3 |
| 1.3.1 | Temperature | 4 |
| 1.3.2 | Rainfall..... | 4 |
| 2. | ASSESSMENT METHODOLOGY | 5 |
| 2.1 | PRELIMINARY DESKTOP STUDY..... | 5 |
| 2.1.1 | <i>Environment Protection and Biodiversity Conservation Act</i> Protected Matters..... | 5 |
| 2.1.2 | Threatened Flora and Communities | 5 |
| 2.1.3 | Environmentally Sensitive Areas (ESAs) and Conservation Reserves | 5 |
| 2.1.4 | Vegetation Type, Extent and Status | 6 |
| 2.1.5 | Wetlands..... | 6 |
| 2.1.6 | Dieback..... | 6 |
| 2.2 | SITE INVESTIGATION..... | 6 |
| 2.2.1 | Licenses..... | 6 |
| 2.3 | PERSONNEL AND REPORTING | 6 |
| 2.4 | LIMITATIONS | 7 |
| 3. | RESULTS | 8 |
| 3.1 | PRELIMINARY DESKTOP ASSESSMENT..... | 8 |
| 3.1.1 | EPBC Act Protected Matters | 8 |
| 3.1.2 | Threatened Flora and Communities | 8 |
| 3.1.3 | Environmentally Sensitive Areas and Conservation Reserves..... | 8 |
| 3.1.4 | Vegetation Type, Extent and Status | 9 |
| 3.1.5 | Wetlands..... | 9 |
| 3.1.6 | Dieback..... | 9 |
| 3.2 | FIELD ASSESSMENT | 9 |
| 3.2.1 | Threatened Flora..... | 9 |
| 3.2.2 | Vegetation Type, Extent and Status | 10 |
| 3.2.3 | Weeds..... | 14 |
| 3.2.4 | Vegetation Condition | 14 |
| 4. | DISCUSSION..... | 15 |
| 5. | REFERENCES..... | 16 |
| | APPENDIX 1 RELEVANT GOVERNMENT DATABASE SEARCH RESULTS..... | 17 |
| | APPENDIX 2 THREATENED FLORA DATABASES SEARCH RESULTS | 27 |
| | APPENDIX 3 VEGETATION CONDITION SCALE (KEIGHERY, 1994)..... | 31 |
| | APPENDIX 4 VEGETATION MAPPING..... | 33 |
| | APPENDIX 5 SPECIES LIST | 38 |

Figures

| | |
|--|----|
| Figure 1: Regional map of survey location (Yellow area) | 2 |
| Figure 2: Mean temperature ranges for Hyden weather station | 4 |
| Figure 3: Monthly and mean rainfall for Hyden weather station 2014..... | 5 |
| Figure 4: <i>Eucalyptus</i> Mallee woodland over <i>Melaleuca</i> shrubland within the survey area..... | 10 |
| Figure 5: <i>Eucalyptus</i> Mallee woodland over <i>Melaleuca</i> shrubland (burnt) within the survey area | 11 |
| Figure 6: <i>Eucalyptus</i> woodland over <i>Allocasuarina</i> shrubland within the survey area..... | 12 |
| Figure 7: <i>Eucalyptus</i> woodland over <i>Allocasuarina</i> shrubland (Burnt) within the survey area ... | 13 |

Tables

| | |
|--|---|
| Table 1: List of potential survey limitations | 7 |
| Table 2: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 511 within the survey area..... | 9 |

1 INTRODUCTION

Convergent Minerals Limited is an Australian gold exploration company, listed on the Australian Stock Exchange (ASX:CVG). CVG has gold projects located in Western Australia and Queensland, with intentions to mine gold from the Mt Holland Project in Western Australia. The Mt Holland Project consists of 12 existing open cut mines and 2 established underground mines, of which CVG is initially concentrating efforts to redevelop the Blue Vein open cut mine for underground mining (Projections of 372,600oz of gold).

The Mount Holland Project is situated approximately 92km northeast of Hyden, and approximately 32km north of the Forrestania Cross Roads (Figure 1).

The total survey area received from CVG covers 89.97ha, within which 32.09ha is existing disturbance comprising a waste landform, open pit, haul roads and access roads. An additional 29.52ha was recently burnt in an intense fire which occurred in April 2014. This report will encompass results of the flora and vegetation survey for the 57.88ha of non-disturbed vegetation within the survey area.

The survey area (L15/346) is located approximately 3km south of the Mt Holland Airstrip and is contained entirely within Mining Tenement M77/1065.

CVG commissioned Native Vegetation Solutions (NVS) to complete a Level 1 Flora and Vegetation Survey of the proposed Blue Vein mine survey area from the 28th to 29th of July 2014, with a follow up survey on 11th August 2014.



Figure 1: Regional map of survey location (Yellow area)

1.1 Objectives

The objective of this report is to document the results of the flora and vegetation component of a Level 1 assessment conducted in accordance with the Environmental Protection Authority (EPA) “*Terrestrial Biological Surveys as an Element of Biodiversity Protection; Position Statement No 3*” (EPA 2002) and *Guidance Statement No. 51 “Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004)”, for the purpose of mining.

A Level 1 study has two components:

1). Desktop study which includes a literature review and a search of the relevant databases;

and

2). Reconnaissance survey of the survey area to verify the desktop survey, to define vegetation units present in the area, search for species of conservation significance and to determine potential sensitivity to impact.

As part of the reporting for the Level 1 assessment, NVS has conducted a Flora and Vegetation Survey which includes broad-scale vegetation mapping and vegetation condition mapping of the survey area.

Therefore, the scope of work for the Flora and Vegetation Survey was to:

- conduct a desktop study that includes a literature review and search of the relevant databases;
- generally describe the vegetation associations in the survey area;
- prepare an inventory of species occurring in the survey area;
- identify any vegetation or flora of particular conservation significance; and
- provide recommendations, including the management of perceived impacts to flora and vegetation within the survey area.

1.2 Geology and Vegetation

The survey area lies in the Coolgardie (COO) bioregion within the Southern Cross (COO2) subregion which totals over 7 million hectares (CALM, 2002). The COO2 subregion has subdued relief, comprising gently undulating uplands dissected by broad valleys with bands of low greenstone hills. It lies on the 'Southern Cross Terrains' of the Yilgarn Craton. The granite strata of Yilgarn Craton are interrupted by parallel intrusions of Archaean Greenstone with occluded drainage. Valleys have Quaternary duplex and gradational soils, and include chains of saline playa-lakes. Diverse *Eucalyptus* woodlands (*Eucalyptus salmonophloia*, *E. salubris*, *E. transcontinentalis* and *E. longicornis*) rich in endemic eucalypts occur around these salt lakes, on the low greenstone hills, valley alluvials and broad plains of calcareous earths. The salt lake surfaces support dwarf shrublands of samphire. The granite basement outcrops at mid-levels in the landscape and supports swards of *Borya constricta*, with stands of *Acacia acuminata* and *Eucalyptus loxophleba*. Upper levels in the landscape are the eroded remnants of a lateritic duricrust yielding yellow sandplains, gravelly sandplains and laterite breakaways. Mallees (*Eucalyptus leptopoda*, *E. platycorys* and *E. scyphocalyx*) and scrub-heaths (*Allocasuarina corniculata*, *Callitris preissii*, *Melaleuca uncinata* and *Acacia beauverdiana*) occur on these uplands, as well as on sand lunettes associated with playas along the broad valley floors, and sand sheets around the granite outcrops. The scrubs are rich in endemic Wattles and Myrtaceae. (CALM, 2002).

1.3 Climate

The climate of the Coolgardie bioregion is arid to semi-arid Warm Mediterranean climate with 250 - 300 mm of mainly winter rainfall (CALM, 2002). The nearest official meteorological weather station with the most complete and up to date information is Hyden, which is located approximately 92 km southwest of the survey area.

1.3.1 Temperature

Mean annual minimum temperature at Hyden is 9.9°C and mean annual maximum temperature is 25°C. The coldest temperatures are attained in July (mean minimum temperature 4.6°C), the hottest is January (mean maximum temperature 33.7°C) and diurnal temperature variations are relatively consistent throughout the year (Figure 2).

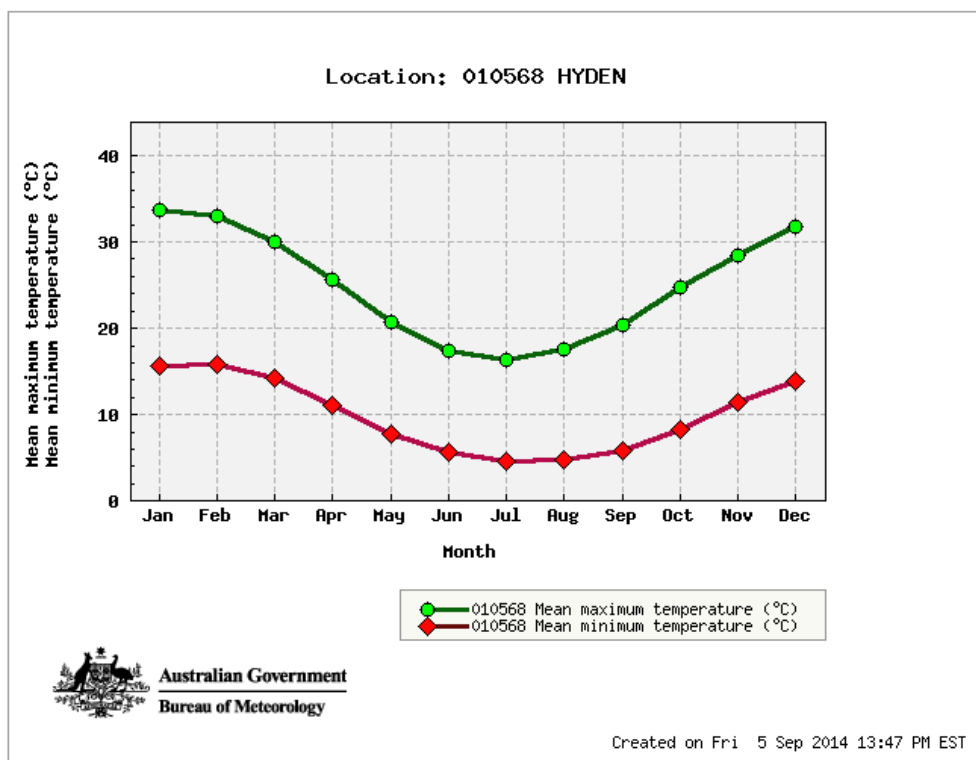


Figure 2: Mean temperature ranges for Hyden weather station

1.3.2 Rainfall

The annual average rainfall at Hyden is 342.3 mm, which falls (>1 mm) on an average of 55.7 rain-days. Larger rainfall events tend to occur between the months of May and September (Figure 3). In 2014 rainfall in April and May greatly exceeded monthly averages, with May receiving almost twice the mean monthly average. February, March, June and August were the only months to receive below average rainfall events.

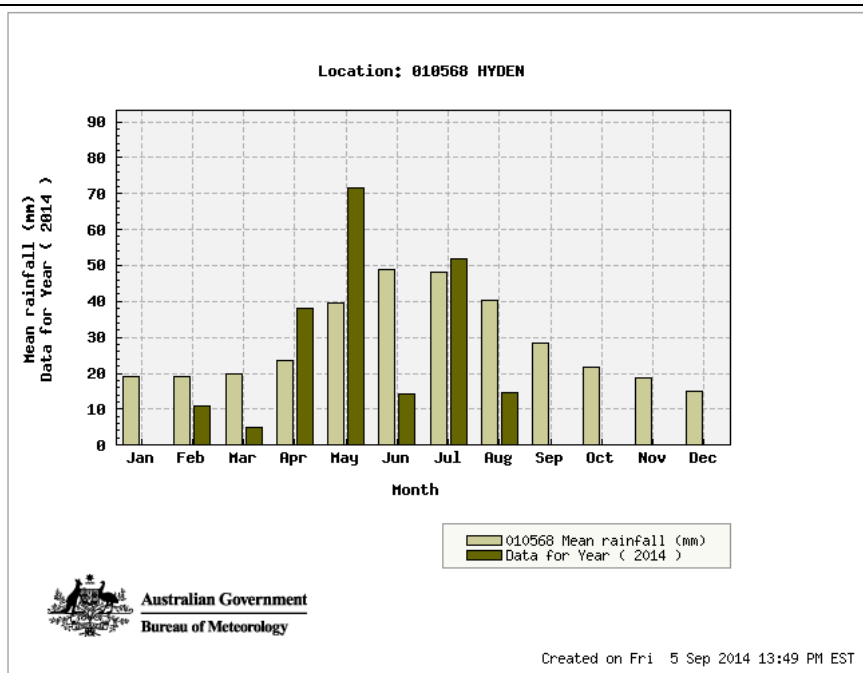


Figure 3: Monthly and mean rainfall for Hyden weather station 2014

2. ASSESSMENT METHODOLOGY

2.1 Preliminary Desktop Study

A preliminary assessment of the survey area and its potential constraints was undertaken by reviewing a number of government agency managed databases (see Appendix 1) and consulting where necessary. The following sections provide a summary of desktop searches undertaken for the project.

2.1.1 *Environment Protection and Biodiversity Conservation Act* Protected Matters

The *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* Protected Matters Search tool was utilised to provide results for matters of National Environmental Significance within the survey area.

<http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-coordinate.jsf>

2.1.2 Threatened Flora and Communities

The Species and Communities Branch of the Department of Parks and Wildlife (DPAW) was contacted for a search of their databases containing known populations of threatened flora (Reference: 29-0514FL).

The presence of Threatened and Priority Ecological Communities (TECs & PECs) was determined by examining Geographic Information System (GIS) data supplied by the DPAW upon request (Reference: 19-0514EC).

2.1.3 Environmentally Sensitive Areas (ESAs) and Conservation Reserves

The Department of Environment Regulation (DER) Native Vegetation Map Viewer was used to determine the location of any ESAs (<http://maps.dec.wa.gov.au/idelve/nv/index.jsp>)

The location of any Conservation Reserves was determined by examining GIS data available from the DPAW website and consulting with the local DER office where necessary.

2.1.4 Vegetation Type, Extent and Status

Vegetation extent and status data was sourced from the Department of Agriculture and Food (DAFWA) report “Land-Use and Vegetation in Western Australia- National Land and Water Resources Audit Report” and its associated GIS file. This data comprises Beard’s Pre-European vegetation groups.

Note: This data was provided to Native Vegetation Solutions via a license agreement with the DAFWA.

2.1.5 Wetlands

The location of wetlands within the project area was determined by examining DAFWA’s Wetland Base (<http://spatial.agric.wa.gov.au/wetlands/>).

2.1.6 Dieback

Dieback is only considered a potential issue for the project if both the mean annual rainfall of the area is >400mm, and if the project area resides below the 26th parallel.

2.2 Site Investigation

A site visit was carried out by Botanist Eren Reid from NVS from the 28th to 29th July 2014 and again on 11th August 2014, to examine the flora and vegetation groups contained within the survey area. A total of 16 hours was spent on site traversing the survey area, by four wheel drive vehicle and on foot.

The survey was conducted in accordance with relevant EPA’s Statements and Guidelines (Section 1.1).

EPA’s *Position Statement No. 3* (EPA, 2002) provides indicative levels of biological survey in relation to the scale and nature of the impact and the sensitivity of the receiving environment. The EPA uses the Interim Biogeographic Regionalisation of Australia (IBRA) as the largest unit for Environmental Impact Assessment decision making in relation to the conservation of biodiversity. Given the scale and nature of the proposed disturbance as well as the existing disturbance, and that the survey area is located within the Coolgardie IBRA region, a Level 1 flora and vegetation survey was required.

2.2.1 Licenses

Flora was collected for identification under the Scientific Collection License SL010748 held by Mr E. R. Reid with expiry 24/10/2014.

2.3 Personnel and Reporting

The following personnel were involved in the preparation of this report;

- Mr Eren Reid (*BSc- Biological Science*), Principal Botanist, Native Vegetation Solutions, undertook the survey, data collation, preparation and review of the report; and
- Mr Frank Obbens (BSc), Consultant Botanist/Plant Taxonomist, Bushtech Consultancy, undertook identification of unknown specimens collected during fieldwork.

2.4 Limitations

Table 1 lists potential limitations that may have affected the survey. These are based on the listing given in the *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004). As shown, this survey was only limited by disturbance in the form of fire. The fire scar affected 29.92% of the 89.97ha survey area. The vegetation was burnt however the overstorey and midstorey was still identifiable in patches, and resembled similar vegetation descriptions as that encountered elsewhere within the survey area.

Table 1: List of potential survey limitations

| Potential Limitations | Constraint (Y/N) | Comment |
|---|------------------|---|
| Competency and experience of the consultants undertaking the survey | N | Mr Eren Reid is an experienced botanist who has conducted many flora and vegetation surveys in the Goldfields, Pilbara and South-west regions of WA. |
| Proportion of flora identified during survey | N | As the survey was planned to target species of conservation significance and flora within a small survey area a complete census of the species present was attempted (Approx. 95%). Sufficient identifications were made to allow vegetation descriptions to be made. |
| Sources of information | N | DRF and Priority Flora GIS information was available from DPAW. |
| Proportion of the task achieved | N | All tasks completed |
| Timing/Season | N | The targeted survey was conducted in Late Winter 2014. Due to the above average rainfall in April and May 2014, many species were in flower with emergent annuals present. |
| Disturbance in survey area | Y/N | Disturbance was present in the form of historic exploration and a recent fire which occurred in April 2014. |
| Intensity of survey effort | N | Transects were walked through the survey area with all parts visited |
| Resources | N | Adequate resources were available |
| Access problems | N | No problems with access |
| Availability of contextual information on the region | N | Information on the Coolgardie Bioregion is readily available. |

3. RESULTS

3.1 Preliminary Desktop Assessment

3.1.1 EPBC Act Protected Matters

The EPBC Protected Matters search tool revealed that the survey area is within the Great Western Woodlands, with the possibility of three Threatened species to occur within the area (*Acacia lanuginophylla*, *Banksia sphaerocarpa* var. *dolichostyla* and *Paragoodia crenulata*). The search also revealed the survey area could possibly be suitable habitat for the weed species *Carrichtera annua* (Wards Weed) (DOTE, 2014).

3.1.2 Threatened Flora and Communities

The DPAW database searches revealed a potential for 1 Presumed Extinct, 6 Threatened and 84 Priority Flora species to occur within a 10km radius of the survey area (DPAW, 2014). No known locations of these Flora occur within the survey area, while the closest location occurs approximately 470m north of the survey area.

Results of the threatened flora database search are included in Appendix 2.

The PEC/TEC search (DPAW, 2014a) revealed that the entire survey area lies within the buffer zone of the Ironcap Hills vegetation complex, Priority 3 PEC. The buffer zone is centred mainly on the Mt Holland, Middle, North and South Ironcap Hills, Digger Rock and Hatter Hill. DPAW (2014b) does not provide a description of this PEC, however, it is inferred that the PEC mainly targets and encompasses the banded ironstone formations within this region.

There are no Banded Ironstone Formations within the survey area, therefore the PEC does not define any vegetation groups within the survey area.

3.1.3 Environmentally Sensitive Areas and Conservation Reserves

No ESA's are located within the survey area (DER, 2014).

3.1.4 Vegetation Type, Extent and Status

Information relating to known vegetation within the survey area has been summarised in Table 2 below. This information has been compiled through both desktop assessments and the site visit.

Table 2: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 511 within the survey area

| Factor | Value | | | | |
|-------------------------------------|--------------------------------------|-------------------------|---|---|---|
| Beard Vegetation Association* | 511 | | | | |
| Vegetation Association Description* | Medium woodland; salmon gum & morrel | | | | |
| Extent (ha) | Scale | | | | |
| | By Association* | By Association** | By IBRA Region** (Coolgardie-COO) | By IBRA Sub-region** (Southern Cross- COO2) | By Shire** (Shire of Yilgarn) |
| | 440,916 | 701,692 | 464,423 | 464,423 | 161,933 |
| % Pre-European Extent Remaining | 51.65% | 74.31% | 93.70% | 93.70% | 83.65% |
| Surrounding Land Use*** | Exploration, Mining | | | | |
| Weed prevalence*** | Low | | | | |

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: Shepherd *et al.* (2002) Associated GIS data

***Source: Field assessment

3.1.5 Wetlands

No wetlands which are recorded on the DAFWA WetlandBase occur within the survey area (DAFWA, 2014).

3.1.6 Dieback

The survey area lies south of the 26th parallel, however receives average annual rainfall of 342.3mm, below the 400mm threshold mark. There is no record of *Phytophthora cinnamomi* establishing in natural ecosystems in regions receiving <400mm rainfall per annum (CALM, 2003). Therefore Dieback is not considered an issue for this survey area, however all measures should be taken to prevent any possible soil contamination (seeds of non-native species *etc.*) which poses a risk in the survey area during seasonally favourable conditions.

3.2 Field Assessment

3.2.1 Threatened Flora

No plant taxa located in the survey area are gazetted as DRF pursuant to subsection 2 of Section 23F of the *Wildlife Conservation Act 1950*. No plant taxa listed as Threatened pursuant to Schedule 1 of the *Environmental Protection and Biodiversity Conservation Act 1999* were located in the survey area.

No Priority Flora species were recorded within the survey area.

3.2.2 Vegetation Type, Extent and Status

A total of 19 Families, 34 Genera and 71 Species were recorded within the survey area. Two major vegetation groups were recorded in the survey area, and are considered to range between degraded and Pristine Health condition (using the scale of Keighery 1994, see Appendix 3). Both vegetation groups had been affected by fire and separate encountered flora lists were recorded for these and included into Appendix 5. Maps of the survey area can be seen in Appendix 4.

The vegetation groups are described in more detail below.

3.2.2.1 *Eucalyptus* Mallee woodland over *Melaleuca* shrubland

This vegetation group consisted of 17 Families, 27 Genera and 57 Species. The vegetation group was approximately 26.73 ha which makes up 29.71% of the survey area. The burnt section of this vegetation group recorded positive identification of 7 Families, 11 Genera and 19 Species, which covered 22.6 ha and made up 25.12% of the survey area.

Dominant species were *Eucalyptus urna*, *E. loxophleba* subsp. *lissophloia*, *E. platycorys*, *Melaleuca pauperiflora* subsp. *pauperiflora*, *M. eleuterostachya*, *M. lateriflora*, *M. cucullata*, *Phebalium filifolium*, and *P. tuberculosa*.



Figure 4: *Eucalyptus* Mallee woodland over *Melaleuca* shrubland within the survey area



Figure 5: *Eucalyptus* Mallee woodland over *Melaleuca* shrubland (burnt) within the survey area

3.2.2.2 *Eucalyptus* woodland over *Allocasuarina* shrubland

This vegetation group consisted of 8 Families, 15 Genera and 20 Species. The vegetation group was approximately 4.59 ha which makes up 5.11% of the survey area. The burnt section of this vegetation group recorded positive identification of 5 Families, 9 Genera and 14 Species, which covered 3.96 ha and made up 4.4% of the survey area.

Dominant species were *Eucalyptus livida*, *E. loxophleba* subsp. *lissophloia*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *A. campestris*, *A. huegeliana*, *Hibbertia rostellata*, *Calothamnus quadrifidus* subsp. *semilunaris*, *Rinzia sessilis*, *Thryptomene kochii* and *Persoonia helix*.



Figure 6: *Eucalyptus* woodland over *Allocasuarina* shrubland within the survey area



Figure 7: *Eucalyptus* woodland over *Allocasuarina* shrubland (Burnt) within the survey area

3.2.3 Weeds

No weed species were recorded within the survey area;

3.2.4 Vegetation Condition

Evidence of a fire and exploration was observed during the field assessment.

Overall, the condition of the vegetation was determined to be “Pristine” with areas which were affected by historic exploration, clearing and fire in “Degraded” condition.

A map of the Vegetation Condition can be seen in Appendix 4.

4. DISCUSSION

The field assessment established that the condition of the vegetation in the survey area (excluding existing disturbance of 32.08ha) is overall “Pristine” (approx. 20.71ha), with certain areas affected by exploration clearing and fire in “Degraded” condition (approx. 37.16 ha).

No DRF, TECs or Priority Flora were recorded in the survey area. The PEC/TEC search (DPAW, 2014a) revealed that the entire survey area lies within the buffer zone of the Ironcap Hills vegetation complex, Priority 3 PEC. The buffer zone is centred mainly on the Mt Holland, Middle, North and South Ironcap Hills, Digger Rock and Hatter Hill. DPAW (2014b) does not provide a description of this PEC, however, it is inferred that the PEC mainly targets and encompasses the banded ironstone formations within this region.

There are no Banded Ironstone Formations within the survey area, therefore the PEC does not define any vegetation groups within the survey area.

Any proposed disturbance/clearing of vegetation will result in a loss of species from the proposed project. However, given the size of the area and the extent of the Beard (Shepherd *et al.*, 2002) vegetation associations elsewhere, the impact on the vegetation and its component flora will not affect the conservation values of either, or create fragmentation or patches of remnant vegetation.

The following recommendations arise from the Level 1 flora survey:

- Where possible, the clearing envelope should be aligned with existing clearing or disturbance;
- Clearing should be kept to the minimum size required;
- All clearing should be kept within the bounds of the survey area; and
- Weed control measures should be implemented during and following clearing and operations.

5. REFERENCES

- Bureau of Meteorology (BOM), (2014) "Climate Data Online", Commonwealth of Australia
<http://www.bom.gov.au/climate/averages/>
 Accessed: 05/09/2014
- CALM, (2002), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002 (COO2 – Southern Cross synopsis)*, Department of Conservation and Land Management
- CALM, (2003), *Phytophthora cinnamomi and Diseases Caused By It, Volume 1-Management Guidelines*, Department of Conservation and Land Management
<http://www.dec.wa.gov.au/pdf/projects/dieback/DBmanual2003.pdf>
 Accessed: 05/09/2014
- Lamp, C., and Collet, F., (1999), *Field Guide to Weeds in Australia (Third edition)*, Inkata Press
- DAFWA, (2014), *WetlandBase*, Department of Agriculture and Food Western Australia,
<http://spatial.agric.wa.gov.au/wetlands/>
 Accessed: 05/09/2014
- DPAW, (2014), *Threatened Flora Database Results Ref: 29-0514FL*, Department of Parks and Wildlife
- DPAW, (2014a), *TEC/PEC Database Results Ref:19-0514EC*, Department of Parks and Wildlife
- DPAW, (2014b), *Priority Ecological Communities for Western Australia Version 21*, Department of Parks and Wildlife
- DER, (2014), *Native Vegetation Map Viewer*, Department of Environment Regulation
<http://maps.dec.wa.gov.au/idelve/nv/index.jsp>
 Accessed: 05/09/2014
- DOTE (2014), *Protected Matters Search Tool*, Department of the Environment
<http://www.environment.gov.au/webgis-framework/apps/pmst/pmst-coordinate.jsf>
 Accessed: 05/09/2014
- EPA, (2002), *Terrestrial Biological Surveys as an Element of Biodiversity Protection: Position Statement No. 3*. Environmental Protection Authority, Perth, WA
- EPA, (2004), *Guidance for the Assessment of Environmental Factors, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia No. 56*, Environmental Protection Authority, Perth, WA
- Keighery, B.J., (1994), *Bushland Plant Survey; A guide to plant community survey for the Community*, Wildflower Society of Western Australia (Inc.) Nedlands
- Shepherd, D.P., Beeston, G.R., and A.J.M. Hopkins, (2002), *LAND-USE AND VEGETATION IN WESTERN AUSTRALIA NATIONAL LAND AND WATER RESOURCES AUDIT REPORT*, Technical Report 250, Department of Agriculture Western Australia
- WAHERB, (2014), *Florabase- the Western Australian Flora*,
<http://florabase.dpaw.wa.gov.au/>
 Accessed 05/09/2014

Appendix 1

Relevant Government Database Search Results



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: 05/09/14 14:01:32

[Summary](#)

[Details](#)

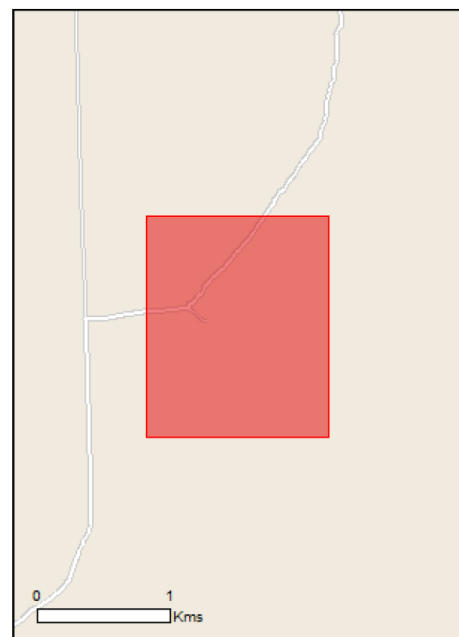
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

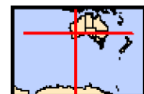
[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 0.0Km



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: | 1 |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Areas: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 5 |
| Listed Migratory Species: | 4 |

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 and the heritage values of a place on the Register of the National Estate.

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.

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: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 4 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Commonwealth Reserves Marine: | None |

Extra Information

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

| | |
|--|------|
| Place on the RNE: | None |
| State and Territory Reserves: | None |
| Regional Forest Agreements: | None |
| Invasive Species: | 6 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

Details

Matters of National Environmental Significance

| National Heritage Properties | | [Resource Information] |
|--|-------|--------------------------|
| Name | State | Status |
| Natural | | |
| Great Western Woodlands of Western Australia | WA | Nominated place |

| Listed Threatened Species | | [Resource Information] |
|---|-----------------------|--|
| Name | Status | Type of Presence |
| Birds | | |
| Leipoa ocellata Malleefowl [934] | Vulnerable | Species or species habitat likely to occur within area |
| Mammals | | |
| Dasyurus geoffroi Chuditch, Western Quoll [330] | Vulnerable | Species or species habitat likely to occur within area |
| Plants | | |
| Acacia lanuginophylla Woolly Wattle [55575] | Endangered | Species or species habitat may occur within area |
| Banksia sphaerocarpa var. dolichostyla Ironcaps Banksia, Ironcap Banksia [10518] | Vulnerable | Species or species habitat likely to occur within area |
| Paragoodia crenulata [86387] | Critically Endangered | Species or species habitat may 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 | | |

| Name | Threatened | Type of Presence |
|--|------------|--|
| Merops ornatus Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Ardea alba Great Egret, White Egret [59541] | | Species or species habitat likely to occur within area |
| Ardea ibis Cattle Egret [59542] | | Species or species habitat may occur within area |

Other Matters Protected by the EPBC Act

| 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 | | |
| 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 likely to occur within area |
| Ardea ibis Cattle Egret [59542] | | Species or species habitat may occur within area |
| Merops ornatus Rainbow Bee-eater [670] | | Species or species habitat may occur within area |

Extra Information

| 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 Resources Audit, 2001. | | |
| Name | Status | Type of Presence |

| Name | Status | Type of Presence |
|--|--------|--|
| Mammals | | |
| Camelus dromedarius Dromedary, Camel [7] | | 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 |
| Vulpes vulpes Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| Plants | | |
| Carrichtera annua Ward's Weed [9511] | | Species or species habitat likely to occur within area |

Coordinates

-32.137786 119.753912,-32.137786 119.766342,-32.150505 119.766342,-32.150505
119.753912,-32.137786 119.753912

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 Heritage and Register of National Estate properties, Wetlands of International 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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.

Acknowledgements

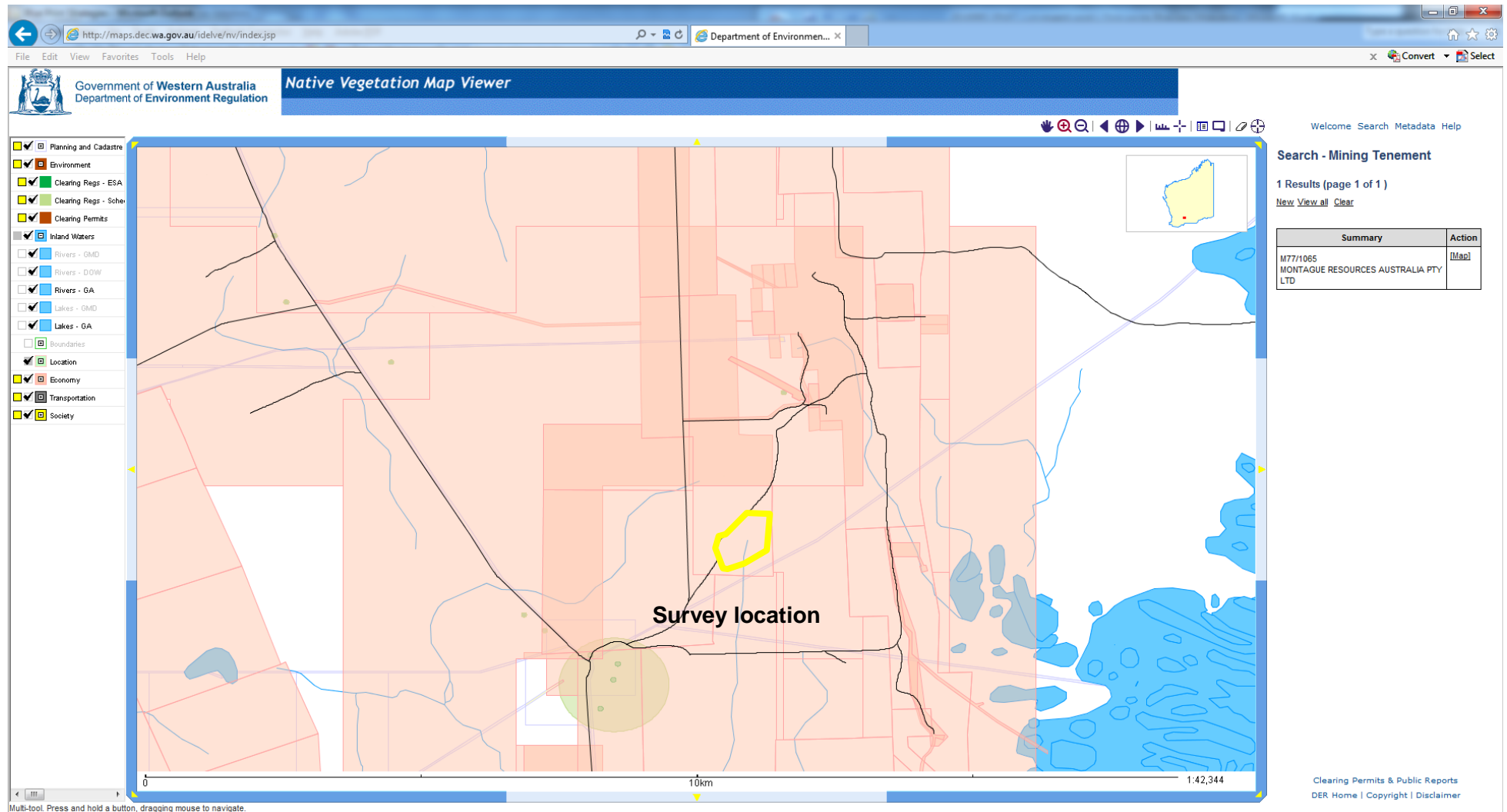
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA 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, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

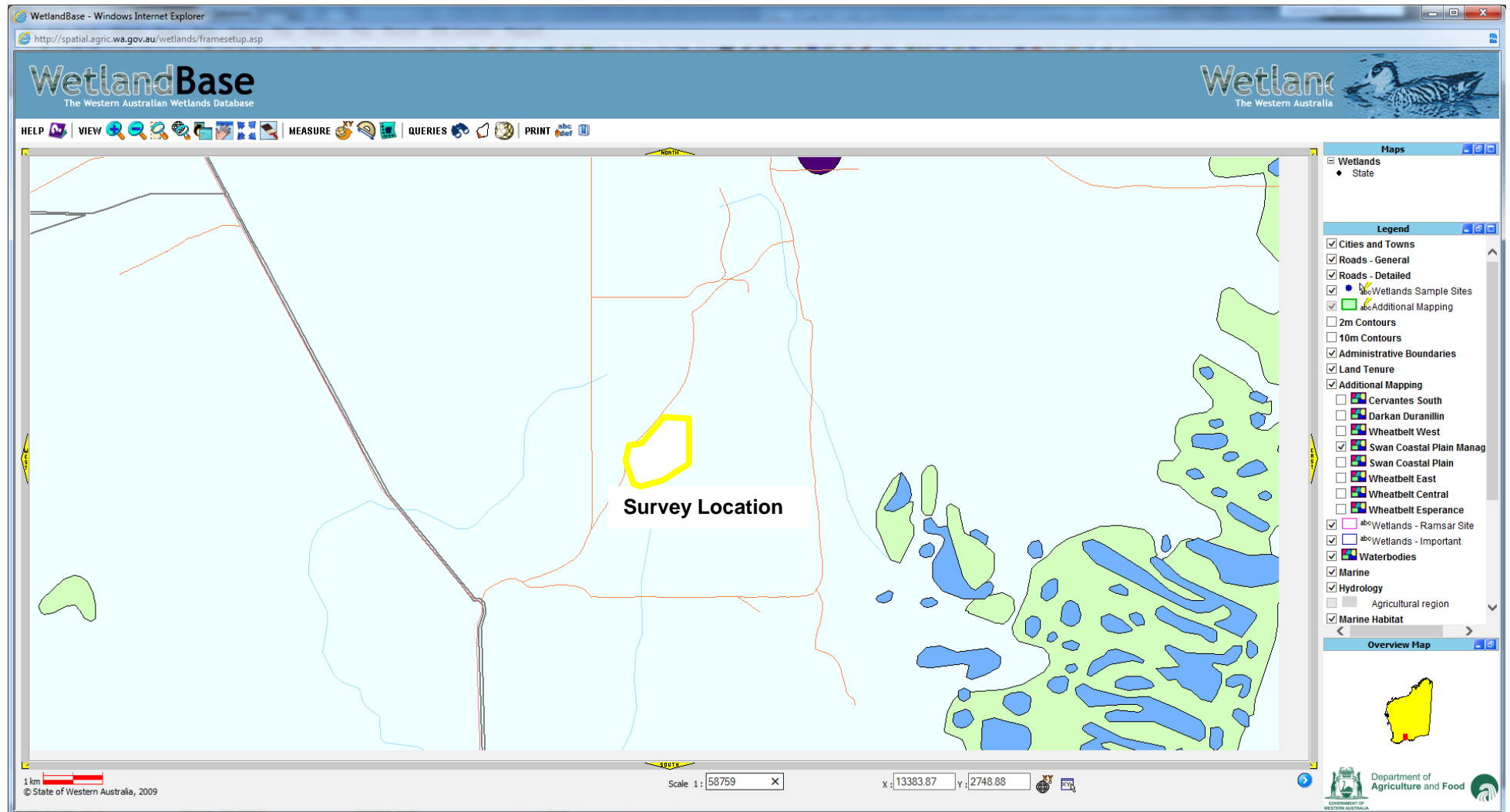
The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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



DER's Native Vegetation Map Viewer showing no ESA's (dark green shaded areas) within the survey area (DER, 2014)



DAFWA Wetland Database showing no wetland areas within the survey area (DAFWA, 2014).

Appendix 2

Threatened Flora Databases Search Results

| Taxon | Status | Rank | DEC Region | Distribution | Flowering Period |
|---|--------|------|----------------|---|------------------|
| <i>Acacia asepala</i> | 2 | | SCST,WHTB | Frank Hann NP, Marvel Loch, Lake Cronin, Forrestiana | Sep |
| <i>Acacia concolorans</i> | 2 | | WHTB | Marvel Loch, Parker Range, Karlgarin | Jul-Sep |
| <i>Acacia kerryana</i> | 2 | | GOLD,SCST,WHTB | Norseman, Jimberlana Hill, Bremer Range, Lake Cronin, Spargoville | Dec-Feb |
| <i>Acacia undosa</i> | 3 | | WHTB | Belka, Lake King, Hyden, Lake Magenta, Tammin, Warralackin, Forrestania, Kondinin | Aug-Sep |
| <i>Baeckea grandibracteata</i> subsp. Parker Range (K. Newbey 9270) | 3 | | WHTB | Parker Range | Oct |
| <i>Baeckea</i> sp. Blue Haze Mine (P. Armstrong 06/910) | 1 | | WHTB | Forrestania | |
| <i>Baeckea</i> sp. Crossroads (B.L. Rye & M.E. Trudgen 241186) | 1 | | WHTB | Forrestania | Nov |
| <i>Baeckea</i> sp. Forrestania (K.R. Newbey 1105) | 1 | | WHTB | Forrestania, Hyden | |
| <i>Baeckea</i> sp. Lake Cronin (K.R. Newbey 9191) | 1 | | WHTB | Lake Cronin | Oct |
| <i>Baeckea</i> sp. Parker Range (M. Hislop & F. Hort MH 2968) | 3 | | GOLD,WHTB | Parker Range, Die Hardy Range, Johnston Range, North Ironcap | Aug |
| <i>Banksia rufa</i> subsp. <i>flavescens</i> | 3 | | SCST,WHTB | Ravensthorpe, Lake King, Frank Hann, Forrestania, Hatters Hill, Bodallin, Narembeen | Aug |
| <i>Banksia sphaerocarpa</i> var. <i>dolichostyla</i> | T | VU | SCST,WHTB | Ironcaps, Forrestania, Mt Hampton, Woollocutty, Bremer Range | Mar-May |
| <i>Beyeria sulcata</i> var. <i>truncata</i> | 3 | | SCST,WHTB | Jerdacuttup, Ravensthorpe, Norseman, Lake King, Frank Hann N.P. | Oct |
| <i>Boronia westringioides</i> | 2 | | WHTB | Forrestania, Lake Cronin | Jul-Sep |
| <i>Bossiaea flexuosa</i> | 3 | | SCST,WHTB | Lake King, Salmon Gums, Frank Hann NP, Forrestania, Bremer Range, Scaddan | Sep-Nov |
| <i>Brachyloma nguba</i> | 1 | | SCST,WHTB | Forrestania, Dragon Rocks, NW of Munglinup | Apr-May |
| <i>Brachyloma</i> sp. Forrestania White (M. Hislop & F. Hort MH 2591) | 1 | | WHTB | Forrestania | May |
| <i>Calamphoreus inflatus</i> | 4 | | WHTB | E of Hyden, Mt Holland, Forrestania, Lake King, Middle Ironcap, Marvel Loch, North Ironcap | Nov-Dec |
| <i>Chamelaucium</i> sp. Parker Range (B.H. Smith 1255) | 1 | | WHTB | Parker Range | Nov-Dec |
| <i>Comesperma calcicola</i> | 3 | | SCST,WHTB | Kau Rock, Pine Hill, Norseman, Forrestania, Mount Ragged | |
| <i>Conospermum sigmoideum</i> | 2 | | SCST,WHTB | Frank Hann NP, Forrestania | |
| <i>Cryptandra polyclada</i> subsp. <i>polyclada</i> | 3 | | GOLD,SCST,WHTB | Tammin, Lake King, Boorabin, Hyden, Forrestania, Ravensthorpe | Ja-F,M,Au-Oc |
| <i>Daviesia elongata</i> subsp. <i>implexa</i> | 3 | | SWST,WHTB | Hopkins NR, Kulin, Newdegate, Lake Grace, Lake Cronin Kulikup, Hyden | |
| <i>Drummondita wilsonii</i> | 1 | | WHTB | Parker Range | Jun-Jul |
| <i>Elatine macrocalyx</i> | 3 | | GOLD,WHTB | Lake Cronin, Googarrrie, Lake Cohen, Northern Territory | May-Oct |
| <i>Eremophila biserrata</i> | 4 | | SCST,WHTB | Lake Cronin, Hyden, Mt Holland, Mt Heywood, Lake Liddlelow, Peak Eleanora, Forrestania, North Ironcap | Jul-Oct |
| <i>Eremophila caerulea</i> subsp. <i>merrallii</i> | 4 | | GOLD,WHTB | Bruce Rock, Jilbadji, Hunt Range, Burra Rock | Aug-Jan |
| <i>Eremophila lucida</i> | 1 | | SCST,WHTB | Forrestania, Norseman | Jul-Oct |
| <i>Eremophila racemosa</i> | 4 | | WHTB | E of Hyden, Lake Cronin | Oct-Dec |
| <i>Eremophila virens</i> | T | EN | SCST,WHTB | Mukinbudin, Westonia, W Norseman | Aug-Oct |
| <i>Eucalyptus exigua</i> | 3 | | GOLD,SCST,WHTB | Lake Cronin, Hyden, Mt Day, Middle Ironcap, Lake Varley, Narembeen, Benari, Moorine Rock, Yellowdine, Jaurdi Stn., Mt Holland | |
| <i>Eucalyptus georgei</i> subsp. <i>fulgida</i> | 4 | | WHTB | Hyden, Mt Holland, Lake Cronin, | Jan-Mar |

| Taxon | Status | Rank | DEC Region | Distribution | Flowering Period |
|--|--------|------|--------------------------|---|------------------|
| <i>Eucalyptus steedmanii</i> | T | VU | WHTB | Forrestania | Jan-Mar |
| <i>Euryomyrtus</i> sp. Parker Range (N. Gibson & M. Lyons 2269) | 1 | | WHTB | Parker Range | Oct |
| <i>Eutaxia acanthoclada</i> | 3 | | SCST,WHTB | Hatter Hill, Forrestania, Mt Gibbs, Hyden, Westonia | - |
| <i>Eutaxia actinophylla</i> | 3 | | GOLD,SCST,WHTB | Norseman, Salmon Gums, Mt Newmont, Bruce Rock, Wallaroo Rock, Mt Willgonarinya | Sep-Dec |
| <i>Eutaxia lasiocalyx</i> | 2 | | GOLD,WHTB | Jilbadji,Mt Holland, Forrestania, Lake Barker, Parker Range | Sep-Nov |
| <i>Eutaxia nanophylla</i> | 3 | | GOLD,SCST,WHTB | Stirling Range, Gnowangerup, Borden, Duranillin, Lake Magenta, Murdong, Lake Cronin, Riverina Stn. | Sep-Nov |
| <i>Frankenia glomerata</i> | 3 | | GOLD,MWST,SCST,SWAN,WHTB | Waeel, Cunderdin, Lake King, Northam, Little Sandy Desert, Carnarvon Range, Norseman, Arrino, Kellerberrin, Three Springs, Yenyenning Lakes | Mar,Nov |
| <i>Gnephosis intonsa</i> | 3 | | GOLD,SCST,WHTB | Gibraltar, Boorabbin, Dundas, Ravenshorpe, North Ironcap, Ora Banda, Lake Cowan, Parker Range | Sep |
| <i>Goodenia heatheriana</i> | 1 | | WHTB | Parker Range, Marvel Loch | Sep,Oct |
| <i>Grevillea pilosa</i> subsp. <i>redacta</i> | 3 | | WHTB | Holt Rock, Lake Cronin, Mt Holland | Sep |
| <i>Grevillea prostrata</i> | 4 | | SCST,WHTB | Newdegate-Lake King, Ravenshorpe, Marvel Loch, Forrestania | Aug-Oct |
| <i>Gyrostemon ditrigynus</i> | 4 | | SCST,WHTB | Lake King, Cascades North, Forrestania, Ravenshorpe, Pingaring, Mt Ridley, Bandalup Hill | - |
| <i>Haegiela tatei</i> | 4 | | GOLD,MWST,SCST,WHTB | Grass Patch, Lake Lockhart, Lake King, Badja Station, Peak Charles N.P., Lake Grace, Lake Magenta N.R., Lake Lockhart, Lake Cronin, Jaurdi Stn. | - |
| <i>Hakea pendens</i> | 3 | | SCST,WHTB | Parker Range, East Forrestania | Sep |
| <i>Hemigenia</i> sp. Newdegate (E. Bishop 75) PN | 1 | | WHTB | Newdegate, Kulin, Forrestania, Barker Lake | Sep-Oct |
| <i>Hibbertia pachyphylla</i> | 3 | | GOLD,SCST,WHTB | Frank Hann NP, Forrestania, Victoria Rocks | Sep-Nov |
| <i>Isolepis australiensis</i> | 3 | | SCST,WHTB | East of Coujinup Hill, Lake Cronin, Jeramungup, Ravnesthorpe, Eastern States, NZ | Jun,Sep |
| <i>Isopogon robustus</i> | T | CR | WHTB | Parker Range, Marvel Loch | Sep-Oct |
| <i>Keraudrenia adenogyna</i> | 3 | | SCST,WHTB | Forrestania, Cairlocup, Frank Hann NP, Mt Holland, Dundas, Gnowangerup | Sep |
| <i>Lasiopetalum fitzgibbonii</i> | 3 | | GOLD,SCST,WHTB | Jilbadji, Jilakin, Nyabing, Jerramungup, Boxwood Hill, Bendinger,Kukerin, Kalgarin, Gnowangerup | Sep-Nov |
| <i>Lepidosperma amantiferrum</i> | 1 | | WHTB | Forrestania | |
| <i>Lepidosperma ferriculmen</i> | 1 | | WHTB | Forrestania | July |
| <i>Lepidosperma</i> sp. Mt Caudan (N. Gibson & M. Lyons 2081) | 1 | | WHTB | Parker Range | |
| <i>Lepidosperma</i> sp. Parker Range (N. Gibson & M. Lyons 2094) | 1 | | WHTB | Parker Range | |
| <i>Leucopogon</i> sp. Yellowdine (M. Hislop & F. Hort MH 3194) | 1 | | GOLD,SCST,WHTB | N of Yellowdine, Holleton,Hyden-Norseman Track, | Jan, May, Aug |
| <i>Leucopogon validus</i> | 1 | | WHTB | Parker Range | Jun-Sep |
| <i>Melaleuca grieviana</i> | 1 | | WHTB | Cowcowing, Narembeen, Parker Range, Wyalkatchem | |
| <i>Melaleuca viminea</i> subsp. <i>appressa</i> | 2 | | SCST,WHTB | Mt Burdett, Ongerup, Skeleton Rock | Sep,Oct |
| <i>Microcorys</i> sp. Forrestania (V. English 2004) | 4 | | WHTB | Mt Holland, Forrestania | Nov-Jan |
| <i>Microseris scapigera</i> | 3 | | SCST,WHTB | Scaddan, Marvel Loch, Lake Grace, Fraser range, Norseman, Southern Hills Stn, Holt Rock,Marble Rocks, Pingrup, Woodanilling, Lake Magenta | Sep-Oct |

| Taxon | Status | Rank | DEC Region | Distribution | Flowering Period |
|--|--------|------|----------------|---|------------------|
| <i>Mirbelia densiflora</i> | 3 | | GOLD,SCST,WHTB | Frank Hann NP, Kumarl, Hatter Hill, Peak Charles, Forrestania, Mt Gibbs, Victoria Rock | Jan |
| <i>Myriophyllum petraeum</i> | 4 | | GOLD,SCST,WHTB | Sth Cross-Mt Ragged, Naremben, Mt Madden, Norseman | Aug-Sep |
| <i>Olearia laciniifolia</i> | 2 | | SCST,WHTB | Lake Grace, Mt Beaumont, Mt Heywood, Peak Charles, Frank Hann N.P., Forrestania | Aug, Sep |
| <i>Paragoodia crenulata</i> | T | VU | WHTB | Lake Cronin | Jul |
| <i>Persoonia cymbifolia</i> | 3 | | SCST,WHTB | Grass Patch, Scaddan, Mt Burdett, Frank Hann N.P., Mt Ridley, Mt Heywood, The Diamonds, Forrestania | |
| <i>Philotheca apiculata</i> | 2 | | GOLD,SCST,WHTB | Norseman, Mt Kirk, Widgiemooltha, Holleaton | Aug-Sep |
| <i>Phlegmatospermum eremaeum</i> | 3 | | GOLD,SCST,WHTB | Coolgardie, Norseman, Cocklebidy, Forrest, Bruce Rock, Helena and Aurora Range, Caiguna | Aug-Oct |
| <i>Pityrodia scabra</i> subsp. <i>dendrotricha</i> | 3 | | GOLD,WHTB | Forrestania, Marvel Loch, Jilbadji, Norseman, Southern Cross (Barker Lake), Widgiemooltha | Oct, Nov |
| <i>Prostanthera nanophylla</i> | 3 | | WHTB | Cadoux, Southern Cross, Jilbadji, Hyden, Mt Day, Woolocutty, Marvel Loch | Oct-Nov |
| <i>Sowerbaea multicaulis</i> | 4 | | GOLD,WHTB | Bullfinch, Karroun Hill, Lake Deborah (Bremer Range - Lake Hope, Lake Cronin) | Nov |
| <i>Sphaerobium validum</i> | 3 | | SCST,WHTB | Bremer Bay, Wellstead, Fitzgerald River NP, Ravensthorpe, Broomehill, Cape Riche, Lake Magenta, Forrestania | Sep-Oct |
| <i>Stylidium validum</i> | 1 | | SCST,WHTB | Forrestania, Bremer Range, Lake Johnson | Sep, Oct |
| <i>Verticordia gracilis</i> | 3 | | WHTB | Mt Holland Rd, Korbel Siding, Koonadgin Siding, Dragon Rocks, Hyden, Merredin, Forrestania, Burngup | Nov |
| <i>Verticordia multiflora</i> subsp. <i>solox</i> | 2 | | WHTB | Cockatoo Tank, Mt Holland Road, Lookout Hill, Norpa, Skeleton Rock, Wogarl | Oct |
| <i>Verticordia pulchella</i> | 2 | | WHTB | Mt Hampton, Nargalyerin Rock, Skeleton Rock | Sep-Oct |

GIS information provided in the Search results (Reference: 29-0514FL) also lists the additional species:

| Taxon | Conservation Code |
|--|-------------------|
| <i>Acacia lanuginophylla</i> | T |
| <i>Chorizema circinale</i> | 1 |
| <i>Dampiera orchardii</i> | 2 |
| <i>Daviesia newbeyi</i> | 2 |
| <i>Dicrastylis capitellata</i> | 1 |
| <i>Eucalyptus myriadena</i> subsp. <i>parviflora</i> | 1 |
| <i>Grevillea dissecta</i> | 4 |
| <i>Grevillea marriottii</i> | 1 |
| <i>Labichea rossii</i> | 1 |
| <i>Logania exilis</i> | 2 |
| <i>Stenanthemum bremerense</i> | 4 |
| <i>Stylidium sejunctum</i> | 2 |
| <i>Thomasia gardneri</i> | X |
| <i>Verticordia stenopetala</i> | 3 |

Appendix 3

Vegetation Condition Scale (Keighery, 1994)

Pristine (1). Pristine or nearly so, no obvious signs of disturbance.

Excellent (2). Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.

Very Good (3). Vegetation structure altered, obvious signs of disturbance.
For example, disturbance to vegetation structure caused by repeating fires, the presence of some more aggressive weeds, dieback, logging and grazing.

Good (4). Vegetation structure significantly altered by very obvious signs of multiple disturbance.
Retains basic vegetation structure or ability to regenerate it.
For example, disturbance to vegetation structure caused by frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

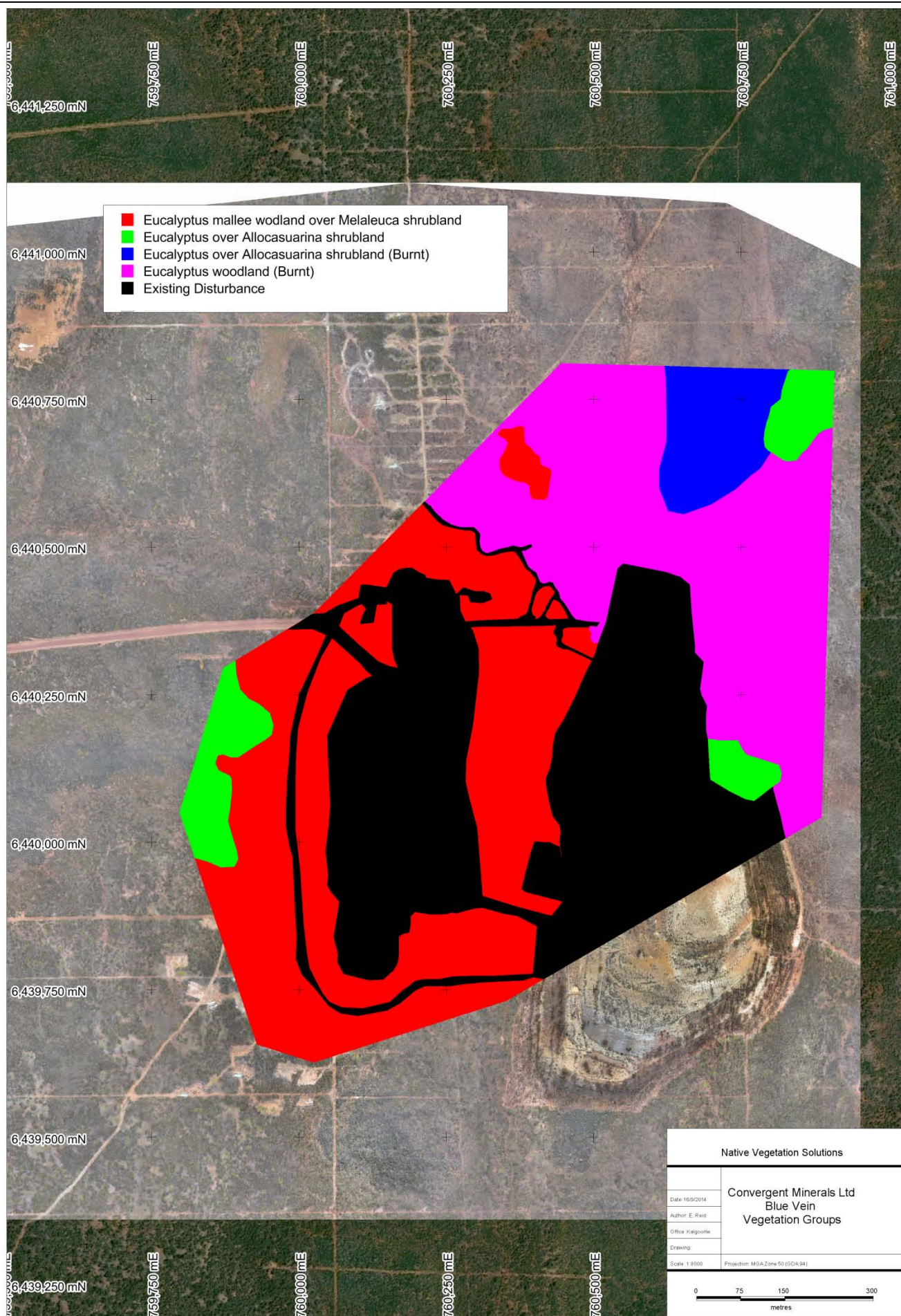
Degraded (5). Basic vegetation structure severely impacted by disturbance.
Scope for regeneration but not to a state approaching good condition without intensive management.
For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

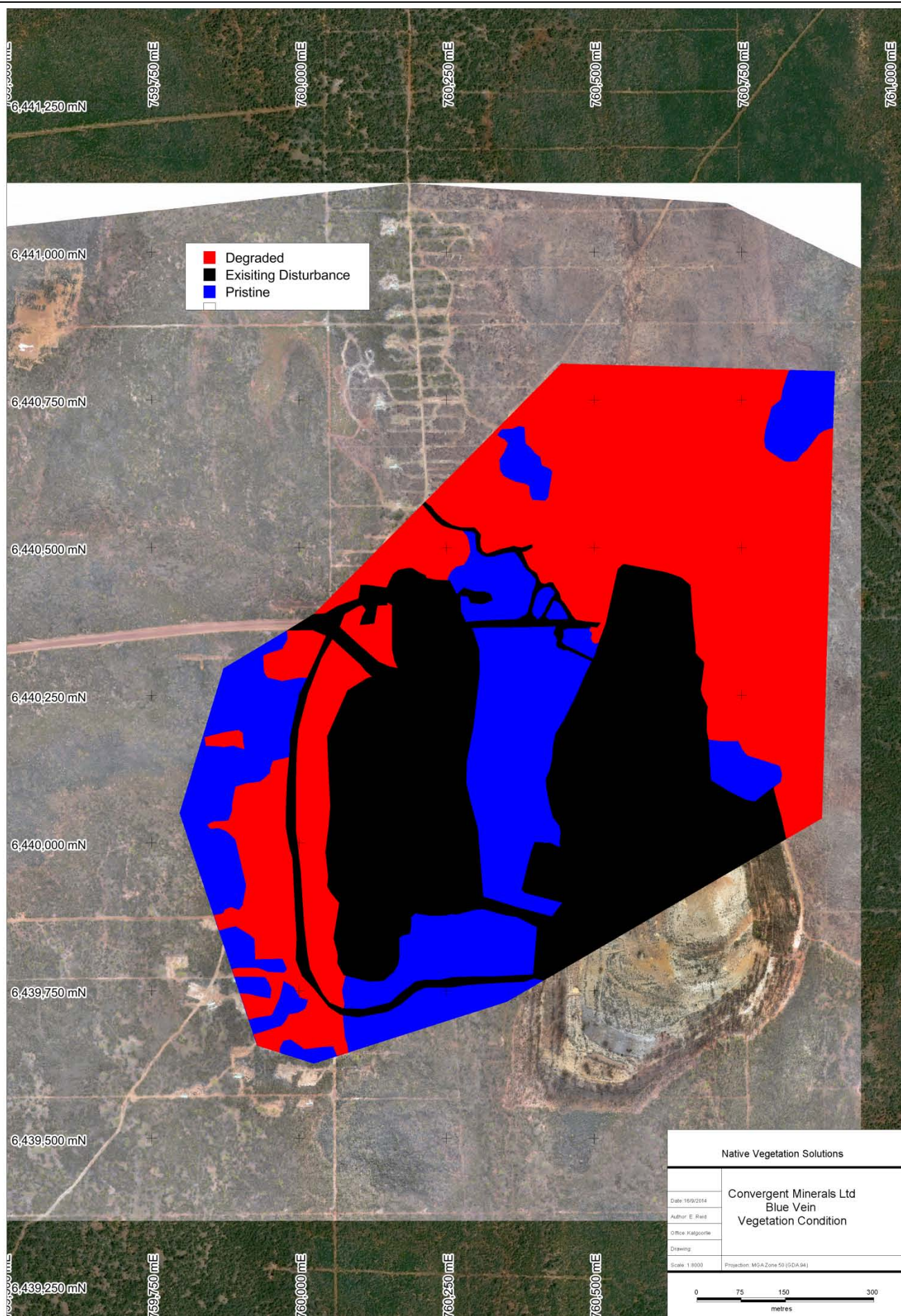
Completely Degraded (6). The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.
These areas are often described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs.

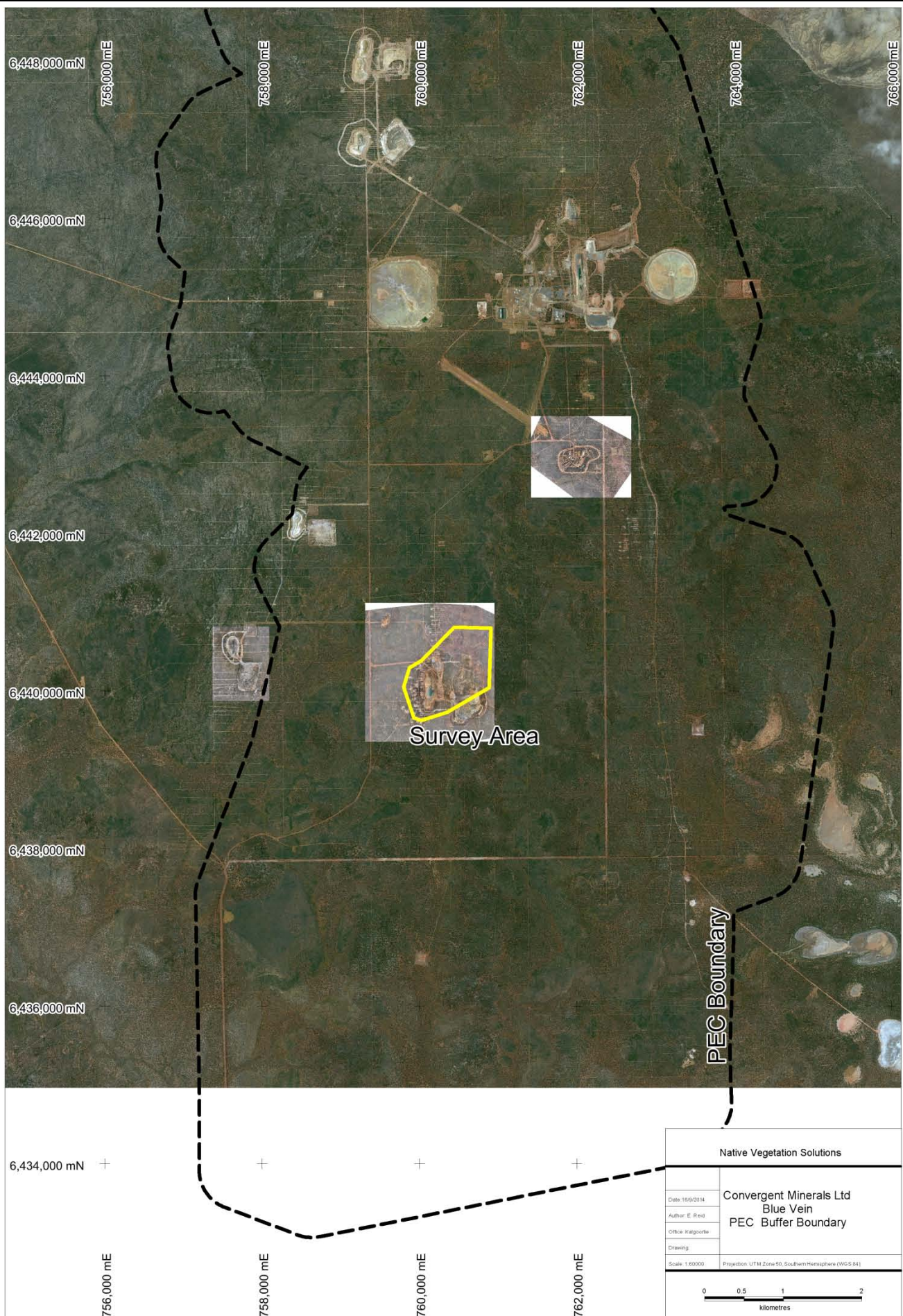
Appendix 4

Vegetation Mapping









Appendix 5

Species List

| Family | Genus | Species | <i>Eucalyptus</i> Mallee woodland over <i>Melaleuca</i> shrubland | <i>Eucalyptus</i> Mallee Woodland over <i>Melaleuca</i> shrubland (Burnt) | <i>Eucalyptus</i> over <i>Allocasuarina</i> shrubland | <i>Eucalyptus</i> over <i>Allocasuarina</i> shrubland (Burnt) |
|----------------|----------------------|--|---|---|---|---|
| Asparagaceae | <i>Thysanotus</i> | <i>manglesianus</i> | | | * | |
| Asteraceae | <i>Olearia</i> | <i>muelleri</i> | * | | | |
| Casuarinaceae | <i>Allocasuarina</i> | <i>acutivalvis</i> subsp. <i>acutivalvis</i> | * | * | * | * |
| Casuarinaceae | <i>Allocasuarina</i> | <i>campestris</i> | * | * | * | * |
| Casuarinaceae | <i>Allocasuarina</i> | <i>huegeliana</i> | * | * | * | * |
| Chenopodiaceae | <i>Sclerolaena</i> | <i>diacantha</i> | * | | | |
| Chenopodiaceae | <i>Sclerolaena</i> | <i>patenticuspis</i> | * | | | |
| Cupressaceae | <i>Callitris</i> | <i>preissii</i> | * | * | | |
| Dilleniaceae | <i>Hibbertia</i> | <i>exasperata</i> | * | | | |
| Dilleniaceae | <i>Hibbertia</i> | <i>pungens</i> | * | | | |
| Dilleniaceae | <i>Hibbertia</i> | <i>rostellata</i> | | | * | * |
| Droseraceae | <i>Drosera</i> | <i>macrantha</i> subsp. <i>macrantha</i> | * | * | | * |
| Ericaceae | <i>Astroloma</i> | <i>serratifolium</i> | | | | |
| Fabaceae | <i>Acacia</i> | <i>acanthoclada</i> subsp. <i>acanthoclada</i> | * | | | |
| Fabaceae | <i>Acacia</i> | <i>camptoclada</i> | * | | | |
| Fabaceae | <i>Acacia</i> | <i>erinacea</i> | * | | | |
| Fabaceae | <i>Acacia</i> | <i>heteroneura</i> var. <i>jutsonii</i> | * | | | |
| Fabaceae | <i>Acacia</i> | <i>hystrix</i> subsp. <i>hystrix</i> | * | | | |
| Fabaceae | <i>Acacia</i> | <i>merrallii</i> | * | * | | |
| Fabaceae | <i>Acacia</i> | <i>sphacelata</i> subsp. <i>sphacelata</i> | * | | | |
| Fabaceae | <i>Daviesia</i> | <i>benthamii</i> subsp. <i>acanthoclona</i> | * | | | |
| Fabaceae | <i>Senna</i> | <i>artemisioides</i> subsp. <i>artemisioides</i> | * | | | |
| Goodeniaceae | <i>Cooperhookeya</i> | <i>strophiolata</i> | * | | | |
| Lamiaceae | <i>Microcorys</i> | <i>obovata</i> | * | | | |
| Lamiaceae | <i>Westringia</i> | <i>cephalantha</i> | * | * | | |
| Lauraceae | <i>Cassytha</i> | <i>melantha</i> | | | * | |
| Lauraceae | <i>Cassytha</i> | <i>nodiflora</i> | * | | | |
| Myrtaceae | <i>Beaufortia</i> | <i>orbifolia</i> | | | * | * |
| Myrtaceae | <i>Calothamnus</i> | <i>quadrifidus</i> subsp. <i>seminudus</i> | | | * | * |
| Myrtaceae | <i>Chamelaucium</i> | <i>ciliatum</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>calycogona</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>cylindriflora</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>eremophila</i> subsp. <i>eremophila</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>livida</i> | | | * | * |
| Myrtaceae | <i>Eucalyptus</i> | <i>loxophleba</i> subsp. <i>lissophloia</i> | * | | * | * |
| Myrtaceae | <i>Eucalyptus</i> | <i>platycorys</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>salmonophloia</i> | * | * | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>salubris</i> | * | | | |
| Myrtaceae | <i>Eucalyptus</i> | <i>urna</i> | * | * | | |
| Myrtaceae | <i>Leptospermum</i> | <i>erubescens</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>acuminata</i> subsp. <i>acuminata</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>adnata</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>cordata</i> | * | * | | |
| Myrtaceae | <i>Melaleuca</i> | <i>cucullata</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>eleuterostachya</i> | * | * | * | * |
| Myrtaceae | <i>Melaleuca</i> | <i>elliptica</i> | * | | | |

| Family | Genus | Species | <i>Eucalyptus</i> Mallee woodland over <i>Melaleuca</i> shrubland | <i>Eucalyptus</i> Mallee Woodland over <i>Melaleuca</i> shrubland (Burnt) | <i>Eucalyptus</i> over <i>Allocasuarina</i> shrubland | <i>Eucalyptus</i> over <i>Allocasuarina</i> shrubland (Burnt) |
|------------------|--------------------|--|---|---|---|---|
| Myrtaceae | <i>Melaleuca</i> | <i>lateriflora</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>laxiflora</i> | * | | | |
| Myrtaceae | <i>Melaleuca</i> | <i>pauperiflora</i> subsp. <i>pauperiflora</i> | * | * | * | * |
| Myrtaceae | <i>Melaleuca</i> | <i>uncinata</i> | * | * | | |
| Myrtaceae | <i>Rinzia</i> | <i>sessilis</i> | * | | * | |
| Myrtaceae | <i>Thryptomene</i> | <i>kochii</i> | * | * | * | |
| Proteaceae | <i>Grevillea</i> | <i>acacioides</i> | * | | | |
| Proteaceae | <i>Grevillea</i> | <i>acuaria</i> | * | | | |
| Proteaceae | <i>Grevillea</i> | <i>oncogyne</i> | | * | | |
| Proteaceae | <i>Hakea</i> | <i>multilineata</i> | | * | | |
| Proteaceae | <i>Hakea</i> | <i>scoparia</i> subsp. <i>scoparia</i> | | * | | |
| Proteaceae | <i>Hakea</i> | <i>subsulcata</i> | | * | | |
| Proteaceae | <i>Isopogon</i> | <i>gardneri</i> | | | * | * |
| Proteaceae | <i>Persoonia</i> | <i>coriacea</i> | | | * | * |
| Proteaceae | <i>Persoonia</i> | <i>helix</i> | | * | * | * |
| Rhamnaceae | <i>Cryptandra</i> | <i>nutans</i> | * | | | |
| Rutaceae | <i>Boronia</i> | <i>inornata</i> subsp. <i>inornata</i> | * | | | |
| Rutaceae | <i>Phebalium</i> | <i>filifolium</i> | * | | | |
| Rutaceae | <i>Phebalium</i> | <i>obovatum</i> | * | | | |
| Rutaceae | <i>Phebalium</i> | <i>tuberculosum</i> | * | | | |
| Santalaceae | <i>Exocarpos</i> | <i>aphyllus</i> | * | | * | |
| Santalaceae | <i>Santalum</i> | <i>acuminatum</i> | * | | * | |
| Sapindaceae | <i>Dodonaea</i> | <i>bursariifolia</i> | * | | * | |
| Sapindaceae | <i>Dodonaea</i> | <i>stenozyga</i> | * | | | |
| Scrophulariaceae | <i>Eremophila</i> | <i>scoparia</i> | * | | | |