



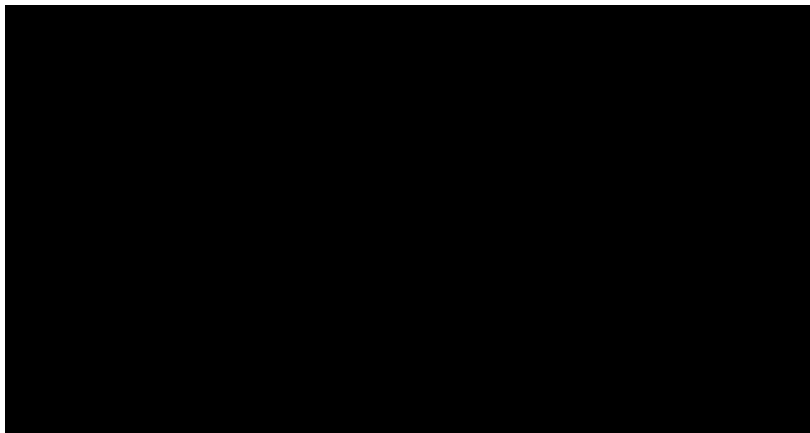
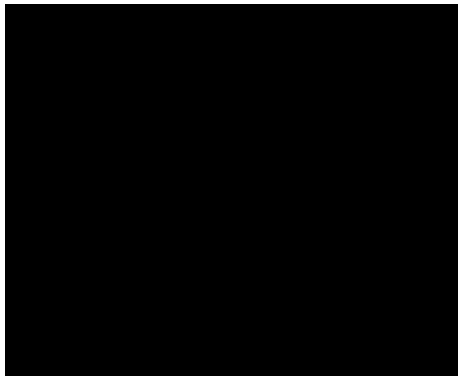
**OPHTHALMIA  
FLORA, VEGETATION AND  
FAUNA ASSESSMENT**



# OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT

*Prepared for*

BHP Billiton Iron Ore



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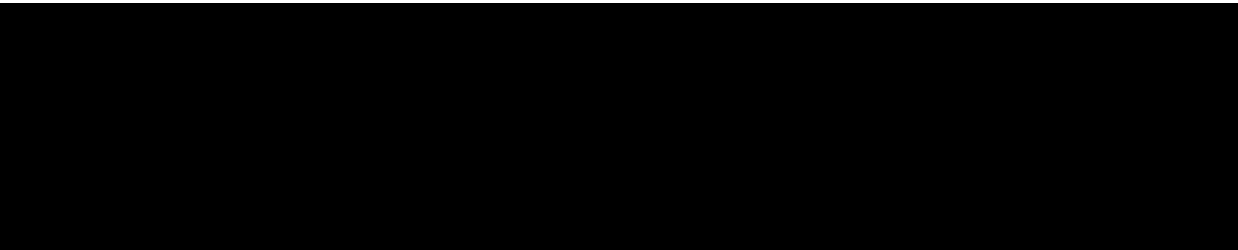
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## **STATEMENT OF LIMITATIONS**

### **Scope of Services**

This environmental site assessment report ('the report') has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and ENV.Australia Pty Ltd (ENV) ('scope of services'). In some circumstances the scope of services may have been limited by factors such as time, budget, access and/or site disturbance constraints.

### **Reliance on Data**

In preparing the report, ENV has relied on data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ('the data'). Except as otherwise stated in the report, ENV has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ('conclusions') are based in whole or in part on the data, those conclusions are contingent upon the accuracy and completeness of the data. ENV will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, unavailable, misrepresented or otherwise not fully disclosed to ENV.

### **Environmental Conclusions**

In accordance with the scope of services, ENV has relied on the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, express or implied, is made.

### **Report for Benefit of Client**

The report has been prepared for the benefit of the Client and for no other party. ENV assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including, without limitation, matters arising from any negligent act or omission of ENV or for any loss or damage suffered by any other party relying on the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions, and should make their own enquiries and obtain independent advice in relation to such matters.

### **Other Limitations**

ENV will not be liable to update or revise the report to take into account any events or circumstances occurring or facts becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.



## EXECUTIVE SUMMARY

ENV.Australia Pty Ltd was commissioned by BHP Billiton Iron Ore, in March 2010 to undertake a Level Two Flora and Vegetation and a Level One Fauna assessment of the Ophthalmia project area.

The purpose of the assessment is to provide supporting documentation for an application for a Native Vegetation Clearing Permit under the *Environmental Protection Act 1986*.

The objectives of the flora and fauna assessment were to:

- conduct a comprehensive database/literature review for the project area;
- provide a summary of previous flora and vegetation surveys;
- conduct a targeted survey for conservation significant flora and vegetation;
- record the occurrence of introduced plant species;
- document, describe and map the vegetation associations present;
- describe the conservation significance of these vegetation associations;
- assess and map vegetation condition;
- document, describe and map the fauna habitats present;
- document the fauna assemblages within the project area; and
- identify fauna of conservation significance that potentially occur within the project area.

No species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), or gazetted as Declared Rare Flora under the *Wildlife Conservation Act 1950* (WA) were recorded in the project area.

Four Priority Flora listed by the DEC were recorded in the project area: *Acacia subtiliformis* (Priority 3), *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3), and *Indigofera gilesii* subsp. *gilesii* (Priority 3).

Two introduced species, *\*Bidens bipinnata* (Bidens) and *\*Malvastrum americanum* were recorded in the project area. Neither of these taxa is listed as Declared Plants under the *Agriculture and Related Resources Protection Act 1976* (WA). *\*Malvastrum americanum* has a moderate rating under the Environmental Weed Strategy for Western Australia.

Eight vegetation associations were mapped in the project area. Vegetation condition ranged from Completely Degraded to Pristine, with most of the project area being described as Pristine or Excellent. Disturbances to vegetation within the project area include fire, introduced flora, tracks and drill pads, cattle and horses.

None of the vegetation associations recorded in the project area are listed as Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, as Environmentally Sensitive Areas under the *Environmental Protection Act 1986 (WA)*, or as Priority Ecological Communities by the Department of Environment and Conservation.

Four land systems (van Vreeswyk et al. 2004) occur in the project area; the Platform, Rocklea, Spearhole and Table Land land systems. The Platform, Rocklea and Spearhole are not likely to be impacted upon by the proposed development. The Table Land land system has a restricted distribution of 77 km<sup>2</sup> (0.04%). Within the project area this land system supports the vegetation association *Triodia* Hummock Grassland 1d with approximately 0.3 km<sup>2</sup> in the project area. As this unit is restricted in distribution it may be affected by the proposed development.

The project area consists of seven fauna habitats: Riverine, Minor Drainage Line, Breakaway, Alluvial Plain, Stony Plain, Hill Slope and Hill Crest. The Riverine habitat has a high habitat value, the Minor Drainage Line, Alluvial Plain and Stony Plain habitats have a moderate habitat value while the Hill Slope and Hill Crest habitats have a low habitat value.

Three conservation significant fauna were recorded in the project area during the survey. Three *Ardeotis australis* (Australian Bustard, Priority 4) were observed overflying the project area and two *Merops ornatus* (Rainbow Bee-eaters, Migratory) were observed in a minor drainage line. One *Pseudomys chapmani* (Western Pebble-mound Mouse, Priority 4), as an active pebble-mound was recorded in the project area. The *Ardeotis australis* and *Merops ornatus* are both mobile species and can easily move to suitable habitats outside of the project area. *Pseudomys chapmani* is a ground-dwelling mammal that has a lower capacity for dispersal. Sixteen conservation significant fauna were identified as having the potential to use the habitats present within the project area. Of these sixteen conservation significant fauna, ten are considered 'Possible' to occur and three were recorded in the project area.

# 1 INTRODUCTION

## 1.1 THE PROJECT

### 1.1.1 Objectives

ENV.Australia Pty Ltd (ENV) was commissioned by BHP Billiton Iron Ore (BHPBIO), in March 2010 to undertake a Level Two Flora and Vegetation and a Level One Fauna assessment of the Ophthalmia project area ('the project area').

The purpose of the assessment is to provide supporting documentation for an application for a Native Vegetation Clearing Permit (NVCP) under the *Environmental Protection Act 1986*.

The objectives of the flora and fauna assessment were to:

- conduct a comprehensive database/literature review for the project area;
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- describe the conservation significance of these vegetation associations;
- assess and map vegetation condition;
- document, describe and map the fauna habitats present;
- document the fauna assemblages within the project area; and
- identify fauna of conservation significance that potentially occur within the project area.

### 1.1.2 Location

The project area is 8,328 hectares (ha) and located 60 kilometres (km) West North-West of the Newman townsite in mining lease tenement E47/24, within the Pilbara region of Western Australia (Figure 1).

## 1.2 ENVIRONMENTAL ATTRIBUTES

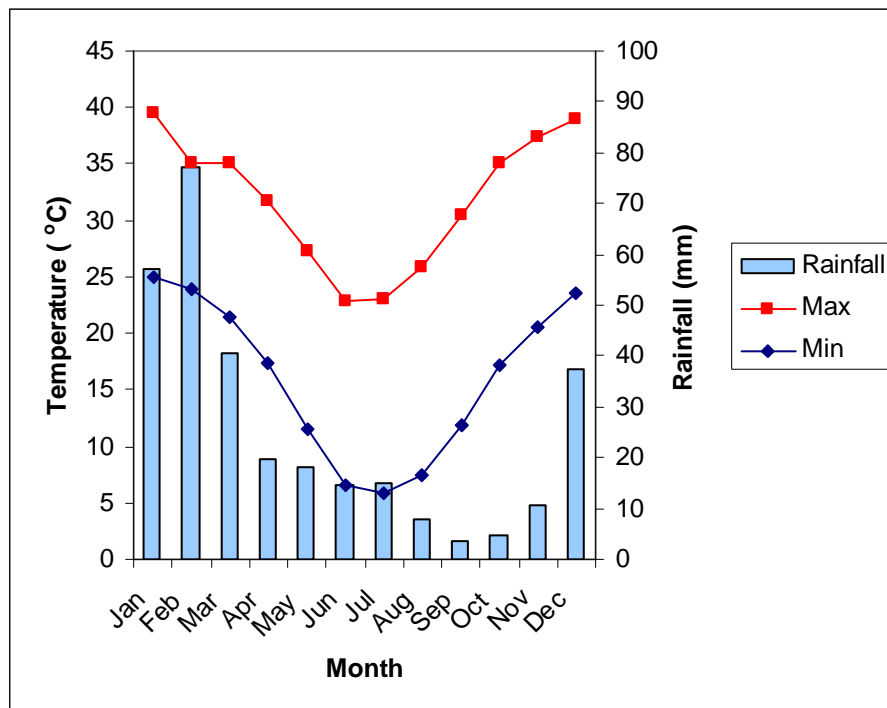
### 1.2.1 Climate

The project area is located in the Pilbara region of Western Australia. The nearest accessible climate data to the project area is available from the Bureau of Meteorology (BoM) Newman Aero weather station located approximately 60 km from the Newman township.

The Pilbara has an arid-tropical climate with two distinct seasons, a hot summer from October to April and a mild winter from May to September. The area experiences a wide temperature range, with an average annual maximum daytime temperature of 32°C (1996-2010). In summer, maximum daytime temperatures may reach 47°C, whilst in winter, minimum night time temperatures may fall to -2°C (BoM 2010).

Rainfall in the Pilbara is often sporadic, and can occur in summer and winter. The Newman area has average annual rainfall of 311.4 mm (1971-2010) (BoM 2010) with the majority of rainfall occurring during the summer months (Figure 2). Summer rainfall is typically associated with tropical storms in the north, or tropical cyclones that cross the coast and move inland. Winter rainfall is commonly the result of cold fronts moving north-easterly across the State.

For the three months preceding the survey Newman received 75 mm of rainfall (February to April 2010), compared with the long term average of 137.3 (1971-2010) for the same period (BoM 2010).



**Figure 2:** Average Monthly Rainfall and Maximum and Minimum Temperatures at Newman from 1971-2010 (BoM 2010)

### 1.2.2 Interim Biogeographic Regionalisation for Australia

The Interim Biogeographic Regionalisation for Australia (IBRA) divides Australia into 85 bioregions based on major biological and geographical/geological attributes (Thackway and Cresswell 1995). These bioregions are subdivided into 404 subregions, as part of a refinement of the IBRA framework (Department of Sustainability, Environment, Water, Population and Communities [DSEWPC] 2010).

The project area is located in the Hamersley subregion (PIL3) of the Pilbara bioregion (Thackway and Cresswell 1995). The Hamersley subregion is characterised by mountain ranges and plateaux of Proterozoic sedimentary rock, dissected by gorges (Kendrick 2001). The vegetation is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and Snappy Gum (*Eucalyptus leucophloia*) over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2001).

### 1.2.3 Land Systems

Land system mapping is based on regional patterns in topography, soils and vegetation. The most recent land system mapping of the Pilbara region, in which the project area lies, was completed by van Vreeswyk *et al.* (2004). The mapping classifies the Pilbara region into 102 land systems. The project area comprises four land systems (Table 1).

**Table 1:** Land Systems of the Project Area

Land System	Description	Extent within Pilbara Region	Proportion of the Pilbara Region
Platform	Dissected slopes and raised plains supporting hard Spinifex grasslands.	1,570 km <sup>2</sup>	0.9%
Rocklea	Basalt hills, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft Spinifex) grasslands.	22,993 km <sup>2</sup>	12.7%
Spearhole	Gently undulating hardpan plains supporting groved mulga shrublands and hard Spinifex.	1,270 km <sup>2</sup>	0.7%
Tableland	Low calcrete plateaux, mesas and low plains supporting mulga and senna shrublands and minor spinifex grasslands	77 km <sup>2</sup>	0.04%

#### 1.2.4 Geology

The following geological units occur in the project area, based on mapping by the Geological Survey of Western Australia (1990):

- Czc: Colluvium – partly consolidated quartz and rock fragments in silt and sand matrix; old valley-fill deposits;
- Czk: Calcrete – sheet carbonate usually formed in major drainage lines;
- Fd: Metadolerite – sills intruded into Fortescue Group; medium-to coarse-grained, massive grey-green rock, usually foliated;
- Fj: Jeerinah Formation – interbedded mudstone, siltstone and chert with minor felsic tuff, dolomite and sandstone;
- Hm: Marra mamba Iron Formation – chert, banded iron-formation, and pelite;
- Qa: Alluvium – unconsolidated silt, sand and gravel; in drainage channels and on adjacent floodplains; and
- Qw: Alluvium and Colluvium – red-brown sandy and clayey soil; on low slopes and sheetwash areas.

#### 1.2.5 Soils

The following soil unit occurs in the project area, based on mapping by Bettenay *et al.* (1967):

- Fa13: Loamy soils with weak pedological development; largely associated with the Hamersley and Ophthalmia ranges. Shallow coherent and porous loamy soils; ranges of banded jaspilite and chert along shales, dolomites and iron formations; some areas of ferruginous duricrust and narrow winding valley plains and steeply dissected pediments. The soils are frequently shallow and stony and there are extensive areas without soil cover. Chief soils are stony earthy loams.

#### 1.2.6 Vegetation Mapping

Vegetation mapping of the Pilbara region was completed on a broad scale (1:1,000,000) by Beard (1975). The project area is situated in the Hamersley Plateau in the Eremaean Botanical Province of Western Australia (Beard 1975). Beard mapped the project area as follows:

- a<sub>1</sub>L<sub>i</sub>/ 18: Mulga low woodland; continuous; and
- e<sub>16</sub>Lr.t<sub>3</sub>H<sub>i</sub>/ 82: Hummock grassland; low tree steppe; *Eucalyptus leucophloia* (Snappy Gum) over Spinifex.

Shepherd *et al.* (2002) re-assessed the mapping of Beard (1975), and updated vegetation boundaries to account for clearing in the intensive land use zone, and divided some larger vegetation units into smaller units. Vegetation types 18 and 82 described by Shepherd *et al.* (2001) correspond with that of Beard (1975) as indicated above.

### 1.3 PREVIOUS BIOLOGICAL STUDIES

Historically, the flora and fauna of the Pilbara has not been systematically recorded in detail; with significant exceptions being the flora studies by Burbidge (1959) and Beard (1975). More recently, the Department of Agriculture (van Vreeswyk *et al.* 2004) conducted an inventory and condition survey of the Pilbara. The report provides a regional inventory of flora and a description of land resources. A comprehensive and systematic field review by the Department of Environment and Conservation (DEC) of Pilbara regional flora has been underway since 2002; the results of this assessment are not yet available.

In recent decades, a boom in large-scale regional resource development projects has resulted in a significant amount of site-specific biological survey work being carried out in the region, most of which is undertaken for formal environmental assessment.

Those most relevant to the current survey, and are encompassed in the project area, are:

- *Ophthalmia Flora and Vegetation Assessment* (ENV 2007a);
- *Ophthalmia Fauna Assessment* (ENV 2007b);
- *Ophthalmia Exploration Project Biological Survey (ecologia Environment 2005a)*;
- *Prairie Downs Flora and Vegetation Assessment* (ENV 2007c); and
- *Prairie Downs Fauna Assessment* (ENV 2007d).

Other biological surveys conducted in the vicinity (*i.e.* within 50 km) of the project area include those undertaken at:

- Mt Whaleback (*ecologia* 1998a)
- Area C (Woodman Environmental Consulting 2008, Outback Ecology 2008, *ecologia* Environment 1998b, 2004a, ENV 2007e-f, 2008a, 2010a);
- South Flank ( ENV 2008b-c);
- Jinayri (*ecologia* Environment 2006, ENV 2008d; 2010b-e);
- Packsaddle (*ecologia* Environment 2004b);
- South Parmelia (Onshore Environmental 2009);
- West Angeles (*ecologia* Environment 1998c, 1999); and
- Mudlark (*ecologia* Environment 2005b).

A comprehensive bibliography of biological survey work undertaken in the Pilbara is available at the DEC website (DEC 2010a).



## 2 METHODOLOGY

### 2.1 BACKGROUND TO THE PROTECTION OF FLORA, VEGETATION AND FAUNA

Flora and fauna are protected formally and informally by various legislative and non-legislative measures, which are as follows:

#### **Legislative Protection**

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*;
- *Wildlife Conservation Act 1950 (WC Act)*; and
- *Environmental Protection Act 1986 (EP Act)*.

#### **Non-Legislative Protection**

- Western Australian DEC Priority lists for flora, fauna and vegetation; and
- Recognition of locally significant populations by the DEC.

A short description of each is given below. Other definitions, including species conservation categories are provided in Appendix A for flora, Appendix B for fauna. Conservation categories for ecological communities are provided in Appendix C.

#### **EPBC Act**

The *EPBC Act* aims to protect matters of national environmental significance. Under the *EPBC Act*, the Commonwealth DEWHA lists threatened species and communities in categories determined by criteria set out in the Act ([www.environment.gov.au/epbc/index.html](http://www.environment.gov.au/epbc/index.html)). This includes flora that fall within one of the categories in Appendix A2, fauna that fall into one of the categories in Appendix B or communities that fall into one of the categories in Appendix C3.

Projects likely to cause impacts on matters of national environmental significance should be referred to DEWHA for assessment under the *EPBC Act*.

#### **WC Act**

The Western Australian DEC lists flora and fauna under the provisions of the *WC Act* as protected according to their need for protection (see Appendix A for flora and Appendix B for fauna).

Flora is given Declared Rare status when their populations are geographically restricted or are threatened by local processes. In addition, under the *WC Act*, by Notice in the Western Australian Government Gazette of 9 October 1987, all native flora (spermatophytes, pteridophytes, bryophytes and thallophytes) are protected throughout the State.

Fauna are classified as Schedule 1 to Schedule 4 according to their need for protection (see Appendix B).

### **EP Act**

Declared Rare Flora (DRF) and TECs are given special consideration in environmental impact assessments, and have special status as Environmentally Sensitive Areas (ESAs) under the *EP Act* and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Exemptions for a clearing permit do not apply in an ESA. In addition, habitat necessary for the maintenance of indigenous fauna is a clearing principle and assessed during consideration of applications for a NVCP.

### **DEC Priority Lists**

The DEC lists 'Priority' flora and fauna that have not been assigned statutory protection under the *WC Act*, but which are under consideration for declaration as DRF or 'Scheduled' fauna.

Flora and fauna assessed as Priority 1-3 (see Appendix A and Appendix B) are in urgent need of further survey. Priority 4 flora require monitoring every 5-10 years (see Appendix A for definitions) while Priority 4-5 fauna are in need of monitoring as they are not currently threatened but could become so (see Appendix B for definitions).

Although DEC Priority species have no formal legal protection, they are under consideration as 'Rare' flora and 'Scheduled' fauna under the *WC Act*.

In addition, the DEC maintains a list of Priority Ecological Communities (PECs) which identifies those communities that need further investigation before possible nomination for TEC status.

Once listed, a community is a PEC, and when endorsed by the Western Australian Minister of Environment becomes a TEC, and protected as an ESA under *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (see Appendix C for definitions).

### **Informal Recognition of Flora and Fauna**

Certain populations or communities of flora and fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, flora and fauna may be locally significant because they are range extensions to the previously known distribution or are newly discovered taxa (and therefore have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (primarily land clearing), and relict populations of such species assume local importance for the DEC. It is not uncommon for the DEC to make comment on these species of interest.

#### **2.1.1 Introduced Species**

The Environmental Weed Strategy for Western Australia (Department of Conservation and Land Management [CALM] 1999) contains criteria for the assessment and ranking of weeds in terms of

their environmental impact on biodiversity (see Appendix D). The Strategy defines environmental weeds as ‘plants that establish themselves in natural ecosystems and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade.’

Plants may also be ‘Declared’ by the Agriculture Protection Board under the *Agriculture and Related Resources Protection Act 1976 (WA) (ARRP Act)*. Declared Plants are gazetted under five categories (P1-P5), which define the action required. Details of the definitions of these categories are provided in Appendix D. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is ‘Declared’, landholders are obliged to control that plant on their properties (Department of Agriculture and Food Western Australia [DAFWA] 2007a).

## 2.2 FLORA SURVEY METHODOLOGY

The survey was carried out in a manner designed to be compliant with EPA requirements for the environmental surveying and reporting for flora and vegetation in Western Australia, as set out in the following documents:

- *Environmental Protection of Native Vegetation in Western Australia: Clearing of Native Vegetation with Particular Reference to Agricultural Areas. Position Statement No.2* (EPA 2000);
- *Terrestrial Biological Surveys as an Element of Biodiversity Protection. Position Statement No. 3* (EPA 2002); and
- *EPA Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia No. 51* (EPA 2004a).

### 2.2.1 Desktop Survey

A desktop survey was undertaken to gather background information on the project area and the flora and vegetation present. This involved a search of the following sources:

- DEC combined biological database *NatureMap* (DEC 2010b);
- DEC Threatened and Priority Flora database (DEC 2010e); and
- previous flora surveys (refer to Section 1.3).

A request for a database search was submitted to the DEC [23° 10' - 23° 23' S and 119° 07' - 119° 32' E, a 50 km radial search] to ascertain whether any Declared Rare or Priority species or any Threatened or Priority Ecological Communities had been recorded in the project area and surrounding areas. In addition, a literature review was conducted, together with a review of records of flora for the project area. These sources were used to compile a list of expected

Declared Rare or Priority species, and Threatened or Priority Ecological Communities that may occur on the landforms in the project areas.

### 2.2.2 Field Survey

The 2010 survey was undertaken between the 12 and 22 May 2010 with 36 person-days invested in the survey.

The survey recorded flora diversity, vegetation composition and structure and assessed vegetation condition through using quadrat data and traversing the project area. Field staff collected flora information using 50 m x 50 m vegetation survey plots, as per BHPBIO requirements (BHPBIO 2009), relevés and opportunistic collections. For areas in which a 50 m x 50 m quadrat was inappropriate, suitable quadrat dimensions were used, whilst maintaining the same total search area. Quadrat locations are illustrated in Figure 3.

A total of 139 quadrats and two relevés were surveyed within the project area. The quadrats were selected as being representative of the flora and vegetation of the project area. Quadrat data including photographs is presented in Appendix E and a species by site matrix is presented in Appendix F.

Data was recorded using standardised field sheets designed in accordance with BHPBIO guidelines (BHPBIO 2009) for those surveys undertaken after 2009. The information noted at each quadrat included landscape features, soils, bare ground and disturbance levels (Condition Scales presented in Appendix G). Each species of plant at each quadrat was recorded, including information on height and percentage cover. This enabled more accurate vegetation mapping to be undertaken, and provided greater detail of the species present. The opportunistic collections focused mainly on the location of new flora taxa not recorded in the quadrats, introduced species, and in particular, Declared Rare and Priority Flora, and flora not well known or not currently described.

### 2.2.3 Taxonomic Identification

One specimen of each taxon was collected for all surveys as per the BHPBIO guidelines (2009). In addition, where field identification of taxa was not possible, specimens were collected systematically for later identification by taxonomists utilising the resources of the Western Australian Herbarium (WAH), through comparison with the reference collection and use of identification keys.

The species list for the project area was checked against FloraBase (WAH 2010) to determine whether any of the species were listed as DRF, Priority Flora or introduced species. Declared Rare and Priority Flora were also checked against the *EPBC Act* listing of threatened species to determine whether any were federally listed. Introduced species were also checked against the Environmental Weed Strategy for Western Australia (CALM 1999), to determine the criteria and ranking in terms of their environmental impact, and the *ARRP Act* to determine whether any were listed as Declared Plants.

In addition, all specimens collected during the current survey that were difficult to identify, range extensions or Priority Flora were validated by the BHPBIO funded taxonomist at the WAH, as per the BHPBIO guidelines (BHPBIO 2009).

### **Vegetation Association Definition, Mapping and Statistical Analysis**

Vegetation associations were described based on their structure and species composition, as defined by quadrat data and field observations. Locations of quadrats were selected using aerial photographs and were positioned to cover observed possible variations in vegetation.

Quadrat and relevé vegetation descriptions were used to delineate vegetation associations in the project area. Vegetation associations were named and categorised in three levels consistent with BHPBIO guidelines; Broad Floristic Formations, Vegetation Associations, and Sub-Associations (BHPBIO 2009).

Vegetation mapping was undertaken in the field and finalised in the office once vegetation association analysis had been completed. Field mapping was carried out using GPS (Magellan) and GIS (OziExplorer and Microstation V7.0) hardware and software.

Multivariate analysis was computed on quadrat data using presence-absence. Quadrat data was transformed to improve normality, and a similarity matrix based on Bray-Curtis similarities was computed. A dendrogram was then computed, using hierarchical agglomerative cluster analysis using *Primer-E* version 6.1.5 (2006). The dendrogram and a discussion of the analysis are presented in Appendix H.

Using the multivariate analysis boundaries of the vegetation associations were drawn over aerial photographs with the aid of GPS coordinates taken throughout the field survey. The vegetation associations were digitised and produced as manipulable electronic mapping data using Microstation V7.0. ESRI shapefiles were created with ARCGIS 9.3.

Once the vegetation associations were determined, they were checked against the listing of Federal and State TECs and State PECs. The vegetation associations were also checked against regional databases, such as Beard (1975), Shepherd *et al.* (2001) and Comprehensive Adequate and Representative (CAR) Reserve Analysis (DAFWA 2007b), to determine their regional representation.

#### **2.2.4 Vegetation Condition Mapping**

Quadrat data, combined with field traverses of the project area, was interpreted and vegetation condition boundaries drawn over an aerial photograph. The vegetation condition mapping was then digitised and produced as manipulable electronic mapping data using Microstation V7.0. ESRI shape files were created with ARCGIS 9.3. Vegetation condition was mapped as per the condition scale presented in Appendix G.

## 2.3 FAUNA SURVEY METHODOLOGY

The survey was carried out in a manner designed to be compliant with the EPA requirements for the environmental surveying and reporting of fauna surveys in WA, as set out in the following documents:

- *Terrestrial Biological Surveys as an Element of Biodiversity Protection. Position Statement No. 3* (EPA 2002); and
- *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia. Guidance Statement No. 56* (EPA 2004b).

### 2.3.1 Database and Literature Review

The purpose of the desktop review was to gather background information on the project area and the fauna that it may support. This involved a search of the following sources:

- Western Australian Museum (WAM) and DEC combined biological database *NatureMap* (DEC 2010b);
- DEC Threatened and Priority Fauna database (DEC 2010d);
- DEWHA Protected Matters Search Tool (DEWHA 2010), also known as an *EPBC* search; and
- previous fauna surveys (e.g. previous ENV reports, other consultant's reports, and DEC reports as per Section 1.3).

Collectively, these sources were used to compile a list of species that have been previously recorded in the region. This list will invariably include some species that do not occur in the project area, as some fauna have a limited or patchy distribution, high level of habitat specificity, are locally extinct or were erroneously identified in previous surveys. Extinct species and clearly erroneous records were excluded from this list.

### 2.3.2 Field Survey

The purpose of the field survey was to verify the accuracy of the desktop survey and further to delineate and characterise the fauna and faunal assemblages present in the project area. The 2010 field survey of the project area was undertaken between the 12 and 17 May 2010.

During the field surveys, broad fauna habitats were identified and mapped based on vegetation structure and landforms. These fauna habitats were then assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna assemblages. Habitats were rated as high, moderate or low on the basis of their complexity, the presence of microhabitats including caves, significant trees with hollows, loose bark, fallen hollow logs and leaf litter, and their representation in the region and project area (Appendix I).

Ornithological surveys were undertaken throughout the entire project area with all habitats surveyed. The ornithologist specifically targeted habitats assessed as likely to support threatened

species and unique or poorly represented habitat in an effort to record species not recorded in earlier surveys.

At all times during the survey, fauna was opportunistically observed and recorded, with a focus on conservation significant fauna, including evidence of pebble mounds, burrows and other traces of specific fauna.

Bat recordings were undertaken at dusk and early evening using AnaBat II recording units to document the presence of bat species in the area. The detectors convert ultrasonic echolocation signals produced by bats into audible electronic signals, which are later analysed (by Michael Brown) to determine the presence of species-specific calls. Caves identified as potential roosting or maternal nesting sites were subjected to AnaBat II recordings. In addition, AnaBat II units were also set in areas deemed likely to be utilised by bats for foraging (e.g. gullies and drainage lines).

### **2.3.3 Taxonomic Identification**

For species identified in the desktop assessment where there is doubt to their true taxonomy (through subsequent name changes or taxonomic reviews) an effort was made to determine the current scientific name for each taxon. In some cases, old scientific names may be presented where correct nomenclature could not be determined due to name changes. Some taxon names may be followed by 'sp.', meaning that the species name was not given in the data source or the identification is in doubt. Where there are previously recorded taxa which have only been identified to species level and have the potential to be a conservation significant species, they are discussed specifically in the results section.

### 3 FLORA AND VEGETATION RESULTS

#### 3.1 VARIABLES INFLUENCING THE FLORA AND VEGETATION SURVEY

There are always variables associated with individual surveys and it is often difficult to predict the extent to which they influence survey outcomes. Table 2 outlines some of the variables identified during the survey of the project area.

**Table 2:** Variables Associated with the Flora and Vegetation Survey

Variable	Impact on Survey Outcomes
Access problems	Most areas of the project area were accessible and adequately surveyed. Some small sections in the south-west of the project area had limited access.
Experience levels	<p>The scientists who conducted these surveys were practitioners suitably qualified in their respective fields.</p> <ul style="list-style-type: none"> <li>• Co-ordinating Botanist: Emma Carroll (Senior Environmental Scientist/ Botanist);</li> <li>• Field Staff: Ciaran Sgherza (Botanist), Bridget Watkins (Environmental Biologist), and Chris Hancock (Senior Botanist).</li> <li>• Taxonomy: Peter Jobson (Taxonomist).</li> <li>• Data Interpretation and Reporting: Bridget Watkins and Todd Edwards (Senior Environmental Scientist / Botanist).</li> </ul>
Timing <sup>1</sup> , weather, season.	<p>Flora composition changes with time, particularly over the seasons and with seasonal conditions. A large proportion of arid flora are annuals and ephemerals and these have both specific growing periods and a requirement for adequate and timely rainfall. Some plants last for a markedly brief time. In the Pilbara, the fire history will also have a significant bearing on the composition of the flora. Therefore, botanical surveys completed at different times will have varying results.</p> <p>The rainfall for the three months leading up to the survey was 75 mm, which is 45% below the long term average of 137.3 mm for the same period (BoM 2010).</p>
Scope: Life forms	Since the survey was undertaken after relatively low rainfall, some perennial species lacked identifiable parts ( <i>i.e.</i> flowers and fruits). In particular some perennial grasses were particularly difficult to identify in the field. Annual

<sup>1</sup> EPA Guidance Statement No, 51 (2004a) stipulates that flora and vegetation surveys should be undertaken following the season that contributes the greatest rainfall in the region. In the Northern Province, this is after summer. In the Eremaean Province, rainfall is sporadic, and in the South-west Province the main rain is in winter, requiring surveys to be undertaken in spring. Short-term variations in normal weather patterns (e.g. drought) may necessitate supplementary survey work at other times of year or in later years to take into account temporal changes in diversity.



Variable	Impact on Survey Outcomes
	<p>species were also likely to have been absent due to the timing of the surveys, and dry conditions.</p> <p>This is also reflected in relatively low species numbers across the survey quadrats, which had an average species count of 19.2. This is compared to an average of 26 species per quadrat recorded in 2007 for Ophthalmia. However this is similar to same season surveys such as that for Area C West which recorded an average of 20.7 species per quadrat.</p> <p>The species list indicates that several groups of flora expected for the area were under-represented or absent in the species inventory. These are mainly annual and perennial herbs including but not limited to <i>Gomphrena</i>, <i>Ptilotus</i>, <i>Trachymene</i>, <i>Polygala</i>, <i>Boerhavia</i>, <i>Polycarpaea</i>, <i>Dysphania</i>, <i>Swainsona</i>, <i>Cassutha</i> and a number of daisy (Asteraceae) species.</p>
Sources of information	<p>At the bioregion level, the Pilbara has been relatively well studied in recent years. Numerous flora and fauna surveys have been undertaken in the area as part of environmental impact assessment processes. Those most relevant to the current study are listed in Section 1.3.</p>
Completeness	<p>The current field survey and combined dataset recorded a taxa richness of 19.2 taxa per quadrat. The level of taxa richness in the project area is considered lower than comparable surveys using similar methodology. For example the taxa richness of nearby surveys ranged from 22.9 taxa per quadrat at the Jinayri Iron Ore project area (based on 328 quadrats) (ENV 2010a) to 37.1 taxa per quadrat at the Area C west project area (based on 248 quadrats) (ENV 2010e). A taxa richness of 26.1 taxa per quadrat (based on 47 quadrats) was previously recorded at the Ophthalmia project area in February 2007 (ENV 2007a).</p>

## 3.2 FLORA

### 3.2.1 Potentially Occurring Flora and Vegetation Communities of Conservation Significance

In the Pilbara region, there are two flora *Lepidium catapycnon* (Hamersley Lepidium) and *Thryptomene wittweri* (Mountain Thryptomene) that are listed as both DRF under the *WC Act* and Threatened Flora under the *EPBC Act*. Additionally, according to Florabase (WAH 2010) as of July 2010 there were 124 Priority Flora listed by the DEC as known from the Pilbara region. Definitions for these categories are provided in Appendix A.

A search of DEC databases for an area just over a 50 km radius of the project area identified known records for one DRF species *Lepidium catapycnon* and 28 Priority Flora (including a lichen). None of these records were from within the project area; four of the 28 Priority Flora [*Acacia subtiliformis*, *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727), *Indigofera gilesii* subsp. *gilesii* and *Rhagodia* sp. Hamersley (M. Trudgen 17794)] were recorded within the project area during this survey. The DEC database search results are provided in Appendix A.

Based on distribution records, *Lepidium catapycnon* (Hamersley Lepidium) has the potential to occur within the project area. *Lepidium catapycnon* is a woody perennial herb or shrub that grows to 0.3 m high, and is typically recorded on skeletal soils on hill slopes (WAH 2010). It is listed as Declared Rare Flora (Vulnerable) under the *WC Act* and as Threatened Flora (Vulnerable) under the *EPBC Act*. Definitions for these categories are provided in Appendix A.

The survey area lies between four known populations of *Lepidium catapycnon*. It has previously been recorded from Pilbara Iron tenements approximately 18 km to the north west, 19 km to the north east and 13 km to the north of the project area and from BHPBIO tenements at Mt Whaleback, approximately 22 km to the east (Table 3). No suitable habitat for the DRF species *Lepidium catapycnon* was recorded as being present within the project area, and it has not been recorded in this or prior surveys of the tenement.

From previous surveys conducted in the area, 16 introduced plants were identified as potentially occurring in the project area, and these species are listed in Appendix D.

**Table 3:** The Likelihood of DRF and Priority Flora Occurring in the Project Area Based on the Survey Results and Literature Review

Priority Flora	Annual or Perennial	Suitable Conditions	Habitat Preference (WAH 2010)	Suitable Habitat Present	Number of Records <sup>1</sup>	Closest Record <sup>2</sup>	Comments	Likelihood in the project Area
<i>Lepidium catapycnon</i> (DRF)	Perennial Shrub	Yes	Skeletal soils. Hillsides.	No	18 records	13 km N 18 km NW 19 km NE 22 km ESE.	Identified in DEC database searches.	Unlikely
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i> (P1)	Perennial Grass	Yes	Hardpan plains.	Yes	2	10 km N.	Identified in DEC database searches. Closest DEC record from groved mulga similar to that present in project area.	Possible
<i>Brachyscome</i> sp. Wanna Munna Flats (S. van Leeuwen 4662) (P1)	Annual Herb	No	(no description)	Yes	3 records	8.5 km NE.	Identified in DEC database searches. Closest DEC records from groved mulga similar to that present in project area.	Possible
<i>Brunonia</i> sp. Long Hairs (D.E. Symon 2440) (P1)	? Herb	No	Along creeklines	Yes	1 record	10 km NE	Identified in DEC database searches. DEC record from groved mulga and footslopes similar to that present in project area.	Possible
<i>Aristida lazarides</i> (P2)	Perennial Grass	Yes	Sand or loam.	Yes	1 record	19 km NE.	Identified in DEC database searches. DEC record from groved mulga and footslopes similar to that present in project area.	Possible
<i>Isotropis parviflora</i> (P2)	Perennial Shrub	Yes	Valley slope of ironstone plateau	No	1 record	10.5 km NE	Identified in DEC database searches. DEC record from lower slopes with <i>Corymbia hamersleyana</i> over <i>Triodia 'basedowii'</i> .	Unlikely
<i>Oxalis</i> sp. Pilbara (M.E. Trudgen 12725)(P2)	? Herb	No	(no description)	Unknown	1 record	13 km N	Identified in DEC database searches. DEC record from hill crest.	Possible

Priority Flora	Annual or Perennial	Suitable Conditions	Habitat Preference (WAH 2010)	Suitable Habitat Present	Number of Records <sup>1</sup>	Closest Record <sup>2</sup>	Comments	Likelihood in the project Area
<i>Acacia bromilowiana</i> (P3)	Perennial Shrub	Yes	Red or orange-brown pebbly loam on laterite, ironstone or basalt on hills, scree, gorges or creeks.	Yes	2 records	4 km N.	Identified in DEC database searches.	Possible
<i>Dampiera metallorum</i> (P3)	Perennial Herb	Yes	Skeletal red-brown gravelly soil over banded ironstone. Steep slopes, summits of hills.	Small area hillslopes	13 records	3 km W	Identified in DEC database searches. Closest DEC records from hillslopes and footslopes similar to that present in project area.	Unlikely
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) (P3)	Annual Herb	No	Red-brown clay soil, calcrete pebbles. Low undulating plain, swampy plains.	Yes in calcrete areas	11 records	Recorded previously in area	Has been previously recorded in area by ENV. Australia	Likely
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431) (P3)	Perennial Grass	Yes	Red clay. Clay pan, grass plain	No	3 records	10.5 km NW 10.5 km NE	Identified in DEC database searches.	Unlikely
<i>Eremophila magnifica</i> subsp. <i>magnifica</i> (P4)	Perennial Shrub	Yes	Skeletal soils over ironstone. Rocky screes	Small area hillslopes	2 records	6.4 km NW	Identified in DEC database searches. Closest DEC record crest of Giles Point.	Unlikely

1. Number of DEC records from Database Search area (DEC 2010c), NatureMap (DEC 2010d).
2. Closest DEC Record.

There are two Threatened Ecological Communities (TECs) as endorsed by the Western Australian Minister for the Environment within the Pilbara region. These are Themeda Grasslands on Cracking Clays and Ethel Gorge aquifer stygobiont community. Neither of these TECs are present within the project area. No TECs under the *EPBC Act* are listed for the Pilbara region.

In addition, the DEC lists 28 Priority Ecological Communities (PECs) as occurring within the Pilbara region. The DEC database search found no known TECs and three PECs occurring in the vicinity of the project area; the Coolibah-lignum Flats community (Priority 3), the Weeli Wolli Spring community (Priority 1) and the West Angelas Cracking-Clays community (Priority 1).

The West Angelas Cracking-Clays PEC is described as:

Open tussock grassland of *Astrebla pectinata*, *A. elymoides*, *Aristida latifolia*, in combination with *A. squarrosa* and low scattered shrubs of *Sida fibulifera*, on basalt derived cracking-clay loam depressions and flowlines (DEC 2010e).

The West Angelas Cracking-Clays PEC buffer is approximately 9.9 km south of the project area.

### 3.2.2 Recorded Flora

A total of 257 taxa (including species, subspecies and varieties) were recorded from the project area. These 257 taxa were from 37 families and 96 genera. Average plant species richness across the 139 sites was 19.2 taxa per quadrat  $\pm$  7.4. Refer to Appendix J for the flora list and Appendix F for the species by site matrix.

The most frequently recorded families were:

- Fabaceae (69 taxa);
- Poaceae (31 taxa); and
- Malvaceae (25 taxa).

The most frequently recorded genera were:

- *Acacia* (40 taxa);
- *Senna* and *Eremophila* (15 taxa); and
- *Sida* (10 taxa).

A total of 225 taxa were recorded during the 2007 survey (ENV 2007a). Of these 77 were not recorded during the 2010 survey. An additional 107 taxa were recorded during the 2010 survey (Appendix J). The difference in species collected is likely due to the change in project area, the season collected, fire age and the different levels of rainfall preceding the surveys.

### 3.2.3 Flora of Conservation Significance

No Threatened species pursuant to the *EPBC Act* were found during the survey of the project area. No plant taxa gazetted as Declared Rare Flora (DRF) pursuant to the *WC Act* were located in the project area.

Four Priority 3 flora listed by the DEC: *Acacia subtiliformis*, *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727), *Indigofera gilesii* subsp. *gilesii* and *Rhagodia* sp. Hamersley (M. Trudgen 17794) were recorded from the project area. The locations of the Priority Flora are presented in Appendix K and Figure 4. The Priority Flora Report Forms are presented in Appendix L.

Specimens collected during the survey were validated by the Western Australian Herbarium as per the BHPBIO guidelines (BHPBIO 2009). See Appendix M for the Plant Specimens Chain of Custody Form and for the Threatened and Priority Flora Report Forms.

*Acacia subtiliformis* (Priority 3) is a perennial, slender erect shrub to 3.5 m in height with globular yellow flowers in June (WAH 2010). This species was recorded at three point locations (totalling 13 individuals and 2 populations) within the project area. It was recorded from calcrete plains.



**Plate 1** *Acacia subtiliformis* (Priority 3)

*Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3) is an annual or biennial herb to 20 cm, with yellow flowers in August (WAH 2010). It is known from low clay plains with calcrete pebbles. This species was recorded at three point locations (totalling 2000 individuals and two populations) within the project area. It was recorded from calcrete plains with one of these populations previously recorded during the ENV (2007a) survey.



**Plate 2** *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3)

*Rhagodia* sp. *Hamersley* (M. Trudgen 17794) (Priority 3) is a perennial erect shrub to 1.4 m in height with red to pink flowers (Plate 4) (WAH 2010). This species was recorded at six locations consisting of 12 individuals within the project area. It was recorded within Mulga woodlands.



**Plate 3** *Rhagodia* sp. *Hamersley* (M. Trudgen 17794)

*Indigofera gilesii* subsp. *gilesii* (Priority 3) is a perennial erect shrub to 1.5 m in height with pink to purple flowers between May and August, and grows in stony soil in hills (WAH 2010). This species was recorded at one location (less than five individuals) just outside of the project area boundary. It was recorded from the hill slopes of the large range to the north of the project area and is likely to occur within the project area in similar habitat.

Additionally, a relatively large proportion of the flora recorded within the project area is at the southern or northern extent of their known range. This is likely to be due to the proximity of the project area to the bioregional boundary between the Pilbara and Gascoyne IBRA regions. The project area is also near to the southern boundary of the Hamersley Range.

### 3.2.4 Introduced Flora

Two introduced species<sup>2</sup>, *\*Bidens bipinnata* (Bidens) (Plate 5) and *\*Malvastrum americanum* (Spiked Malvastrum) (Plate 6) were recorded in the project area. The locations of these species are presented in Appendix N and mapped in Figure 5. *\*Bidens bipinnata* was recorded mainly from within Mulga groves while *\*Malvastrum americanum* was recorded from within drainage lines. One other introduced species, *\*Cenchrus ciliaris* was previously recorded in the area during the 2007 survey (ENV 2007a). This species was not recorded during the current survey most likely due to the dry conditions.



**Plate 5** *\*Bidens bipinnata* (Beggars' Ticks)



**Plate 6** *\*Malvastrum americanum* (Spiked Malvastrum)

No agricultural weeds listed as Declared Plants under the *ARRP Act* were recorded. Two environmental weeds as defined by the Environmental Weed Strategy for Western Australia (CALM 1999) were recorded for the project area, *\*Bidens bipinnata* and *\*Malvastrum americanum*. The rating and criteria for these species inclusion under this strategy are presented in Table 4. Refer to Appendix D for a definition of the criteria used.

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<sup>2</sup> An asterisk (\*) preceding the scientific name of a species indicates that the taxon is introduced.



**Table 4:** Introduced Plant Species Listed by the Environmental Weed Strategy (CALM 1999) for Western Australia Located Within the Project Area

Taxon	Common Name	Criteria			
		Rating	Invasiveness	Distribution	Impacts
<i>*Malvastrum americanum</i>	Spiked Malvastrum	Moderate	Yes	Yes	N/A
<i>*Bidens bipinnata</i>	Beggar's Ticks	N/A	N/A	N/A	N/A

### 3.2.5 Vegetation Associations

The project area contains eight vegetation associations within three broad floristic formations (Figures 6 and 7).

No TECs or PECs were recorded in the project area. The vegetation associations mapped within the project area are described in detail on the following pages.

**Broad Floristic Formation: *Triodia* Hummock Grassland**

**Vegetation Association: 1a**

Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on red-brown loam with a covering of cobbles and pebbles on low hills.



**Area:** 2619.7 ha

**Quadrats Sampled**

Ophthalmia: 42, 94, 80, 93, 90, 120, 95, 133, 137, 116, 66, 64, 130, 124, 78, 52, 26, 20, 46, 87, 110, 111, 28, 32, 143, 63.

**Landform Description**

**Location and Landform:**

This association is located on low hills within the project area.

**Geology:**

Colluvium and Laterite (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown loam with cobbles and pebbles covering the soil surface.

**Litter Cover:**

1% Logs, 2% Twigs and 2% Leaves.

**Bare Ground:**

35-85%.

**Vegetation Structure and Floristics**

The *Triodia wiseana* hummock grassland with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* is the main diagnostics of this association which is found on low hills.

Stratum		Key Characteristics
<b>Overstorey</b>		
Canopy Layer	Scattered Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia deserticola</i> subsp. <i>deserticola</i> and <i>Corymbia hamersleyana</i> to a height of 10 m.	
<b>Midstorey</b>		
Middle Shrub Layer	Open Shrubs of <i>Acacia ancistrocarpa</i> , <i>Acacia bivenosa</i> and <i>Acacia inaequilatera</i> between 1-2 m.	
Lower Shrub Layer	Low Open Shrubs of <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> , <i>Rulingia loxophylla</i> , <i>Acacia kempeana</i> , <i>A. pruinocarpa</i> , <i>Ptilotus astrolasius</i> subsp. <i>astrolasius</i> , <i>P. calostachyus</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> , under 1 m.	
<b>Understorey</b>		
Hummock Grasses	Hummock Grassland of <i>Triodia wiseana</i> , <i>T. sp.</i> Shovelanna Hill (S. van Leeuwen 3835) and <i>T. pungens</i> to 0.5 m.	
Tussock Grasses	Tussock Grassland of <i>Themeda triandra</i> , <i>Paraneurachne muelleri</i> and <i>Cymbopogon obtectus</i> to 0.5 m.	

**Vegetation Condition**

**Condition Rating:**

Pristine.

**Disturbances:**

Fire, old drill pads nearby, old tracks nearby and cattle tracks on surrounding plains.

**Average Fire Age:**

Young to Old.

**Broad Floristic Formation: *Triodia* Hummock Grassland**

**Vegetation Association: 1b**

Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on red-brown loam on low hills.



**Area:** 2315.5 ha

**Quadrats Sampled**

Ophthalmia: 21, 23, 49, 106, 92, 134, 101, 88, 119, 65, 13, 11, 56B, 47, 45, 17, 54, 122.

**Landform Description**

**Location and Landform:**

This association is located on the low hills of the project area.

**Geology:**

Laterite and Jeerinah Formation (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown loam with covering of cobbles and pebbles on the surface of the soil.

**Litter Cover:**

1% Logs, 1% Twigs and 1% Leaves.

**Bare Ground:**

50-95%.

**Vegetation Structure and Floristics**

The Scattered Low Trees and Mallees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* is a diagnostic of this association.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Scattered Low Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> and <i>Eucalyptus repullulans</i> to a height of approximately 5 m.
<b>Midstorey</b>	
Middle Shrub Layer	Open Shrubland of <i>Acacia synchronicia</i> , <i>A. bivenosa</i> and <i>A. tetragonophylla</i> , <i>A. kempeana</i> , <i>A. pruinocarpa</i> between 1-4 m.
Lower Shrub Layer	Low Open Shrubland <i>Ptilotus astrolasius</i> var. <i>astrolasius</i> , <i>P. rotundifolius</i> <i>Eremophila forrestii</i> subsp. <i>forrestii</i> .
<b>Understorey</b>	
Hummock Grasses	Hummock Grassland of <i>Triodia brizoides</i> and <i>Triodia wiseana</i> to 0.5 m.
Tussock Grasses	Scattered Tussock Grass of <i>Cymbopogon obtectus</i> and <i>Themeda triandra</i> to 0.5 m.

**Vegetation Condition**

**Condition Rating:**

Excellent to Pristine

**Disturbances:**

Fire, horses, and tracks nearby.

**Average Fire Age:**

Recent to Old.

**Broad Floristic Formation: *Triodia* Hummock Grassland**

**Vegetation Association: 1c**

Hummock Grassland of *Triodia wiseana*, *T. brizoides* and *T. pungens* with Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Acacia citrinoviridis* with Low Open Shrubland of *Scaevola browniana* subsp. *browniana*, *Eremophila jucunda* subsp. *pulcherrima* and *Keraudrenia nephrosperma* on red-brown loam on steep hill slopes.



**Area:** 34.6 ha

**Quadrats Sampled**

Ophthalmia: 131, 129.

**Landform Description**

**Location and Landform:** This association is located within the southern facing steep hill slopes in the northern section of the project area.

**Geology:** Jeerinah Formation (after Geological Survey of Western Australia 1990).

**Soil Attributes:** Red-brown loam with covering of cobbles and pebbles on the surface of the soil.

**Litter Cover:** 1% Logs, 3% Twigs and 5% Leaves. **Bare Ground:** 20-45%.

**Vegetation Structure and Floristics**

The Low Shrubland of *Keraudrenia nephrosperma* is a diagnostic of this association

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Low Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia deserticola</i> subsp. <i>deserticola</i> and <i>Acacia citrinoviridis</i> to a height of approximately 10 m.
<b>Midstorey</b>	
Lower Shrub Layer	<i>Scaevola browniana</i> subsp. <i>browniana</i> , <i>Eremophila jucunda</i> subsp. <i>pulcherrima</i> , <i>Keraudrenia nephrosperma</i> and <i>Mirbelia viminalis</i> to a height of 1 m.
<b>Understorey</b>	
Hummock Grasses	Very Open Hummock Grassland <i>Triodia wiseana</i> and <i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739).
Tussock Grasses	Tussock Grassland of <i>Eriachne helmsii</i> to 0.3 m.

**Vegetation Condition**

**Condition Rating:** Pristine.

**Disturbances:** Nil.

**Average Fire Age:** Moderate to Very Old.

**Broad Floristic Formation: *Triodia* Hummock Grassland**

**Vegetation Association: 1d**

Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on red-brown loam with a covering of cobbles and pebbles on Low undulating hills.



**Area:** 323.0 ha

**Quadrats Sampled**

Ophthalmia: 40, 100, 74, 27, 82, 84, 86, 77, 136, 57, 127, 73, 128, 07, 81, 102, 03, 27

**Landform Description**

**Location and**

**Landform:**

This association is located on low hills within the project area, mainly on calcrete.

**Geology:**

Laterite and Calcrete (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown loam with cobbles and pebbles covering the soil surface.

**Litter Cover:**

<1% Logs, 2% Twigs and 2% Leaves.

**Bare Ground:**

30 – 85%

**Vegetation Structure and Floristics**

The Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya* are a diagnostic of this association which is found on the hillslopes.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Open Mallees of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> , <i>E. trivalva</i> and <i>E. repullulans</i> ) to a height of 8 m.
<b>Midstorey</b>	
Middle Shrub Layer	Open Shrubland of <i>Melaleuca eleuterostachya</i> , <i>Acacia bivenosa</i> and <i>A. synchronicia</i> between 0.5-2.5 m.
Lower Shrub Layer	Scattered Shrubs of <i>Acacia tetragonophylla</i> and <i>Acacia kempeana</i> and <i>A. synchronicia</i> between 0.2-1 m.
<b>Understorey</b>	
Hummock Grasses	Hummock Grassland of <i>Triodia wiseana</i> , <i>T. angusta</i> and <i>T. brizoides</i> to 0.5m

**Vegetation Condition**

**Condition Rating:**

Pristine.

**Disturbances:**

Fire, Flooding, Nearby Tracks.

**Average Fire Age:**

Moderate.

**Broad Floristic Formation: *Triodia* Open Hummock Grassland**

**Vegetation Association: 1e**

Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on red-brown loam with a covering of cobbles and pebbles on Undulating Plains.



**Area:** 688.8 ha

**Quadrats Sampled**

Ophthalmia: 48, 62, 36, 97, 30, 05, 10, 19, 41, 01, 115, 72, 56A, 67, 06

**Landform Description**

**Location and Landform:**

This vegetation association is located within the low plains of the project area.

**Geology:**

Laterite (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown loam with cobbles and pebbles covering the soil surface.

**Litter Cover:**

2% Logs, 4% Twigs and 10% Leaves.

**Bare Ground:**

35 - 95%.

**Vegetation Structure and Floristics**

The Low Open Woodland of *Acacia aneura* var. *microcarpa* is one of the main diagnostics of this association.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Low Open Woodland of <i>Acacia aneura</i> var. <i>microcarpa</i> , <i>A. citrinoviridis</i> and <i>A. catenulata</i> subsp. <i>occidentalis</i> to a height of 6m
<b>Midstorey</b>	
Middle Shrub Layer	Scattered Shrubs of <i>Acacia distans</i> and <i>Acacia aneura</i> var. <i>intermedia</i> between 1-4 m.
Lower Shrub Layer	Low Open Shrubland of <i>Eremophila forrestii</i> , <i>Acacia pruinocarpa</i> and <i>Sida ectogama</i> under 1 m.
<b>Understorey</b>	
Hummock Grasses	Open Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) <i>T. melvillei</i> and <i>T. pungens</i> to 0.5m.

**Vegetation Condition**

**Condition Rating:**

Excellent.

**Disturbances:**

Fire, Cattle, Flood and Old Tracks.

**Average Fire Age:**

Old.

**Broad Floristic Formation: *Triodia* Hummock Grassland**

**Vegetation Association: 1f**

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies.



**Area:** 1233.5 ha

**Quadrats Sampled**

Ophthalmia: 75, 113, 117, 121, 123, 125, 25, 33, 39, 43, 55, 61, 69, 71, 103, 34, 68, 114, 60, 135, 91, 109, 53, 99, 126, 141, 31, 132, 89, 83

**Landform Description**

**Location and Landform:**

This association is located within the low hills and undulating plains of the project area.

**Geology:**

Jeerinah Formation and Laterite (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown loam with cobbles and pebbles covering the soil surface.

**Litter Cover:**

1% Logs, 3% Twigs and 2% Leaves.

**Bare Ground:** 30 – 97%

**Vegetation Structure and Floristics**

The Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* is one of the main diagnostics of this association.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Low Open Woodlands of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia hamersleyana</i> and <i>Acacia aneura</i> var. <i>aneura</i> to a height of approximately 5 m.
<b>Midstorey</b>	
Middle Shrub Layer	Tall Shrublands of <i>Acacia catenulata</i> subsp. <i>occidentalis</i> , <i>A. citrinoviridis</i> and <i>A. pruinocarpa</i> .
Lower Shrub Layer	Low Scattered Shrubs of <i>Grevillea berryana</i> under 1 m.
<b>Understorey</b>	
Hummock Grasses	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835), <i>T. pungens</i> and <i>Triodia wiseana</i> to 0.5m

**Vegetation Condition**

**Condition Rating:**

Pristine.

**Disturbances:**

Fire, Cattle, Nearby Track, Flooding.

**Average Fire Age:**

Moderate.

**Broad Floristic Formation: *Themeda* Tussock Grassland**

**Vegetation Association: 2a**

Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothematica* and *E. victrix* on red-brown clayey loam in drainage lines.



**Area:** 476.3 ha

**Quadrats Sampled**

Ophthalmia: 4, 15, 9, 96, 79, 44, 38, 51, 35, 85, 105, 107, 98, 112, 104, 108, 50, 29, 37, 59, 76, 118, 139, 70, 12.

**Landform Description**

**Location and Landform:**

This vegetation association is located within the drainage lines of the project area.

**Geology:**

Alluvium (after Geological Survey of Western Australia 1990).

**Soil Attributes:**

Red-brown clayey loam.

**Litter Cover:**

2% Logs, 4% Twigs and 8% Leaves.

**Bare Ground:**

8-85%.

**Vegetation Structure and Floristics**

The Tussock Grassland of *Themeda triandra* with Scattered Low Trees of *Eucalyptus xerothematica* and *E. victrix* are diagnostics of this association.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Scattered Low Trees of <i>Eucalyptus xerothematica</i> and <i>Eucalyptus victrix</i> to a height of 10 m.
<b>Midstorey</b>	
Middle Shrub Layer	Open Mallees of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> , <i>Eucalyptus repullulans</i> and <i>Eucalyptus trivalva</i> between 1-3 m.
Lower Shrub Layer	Scattered Low Shrubs of <i>Eremophila longifolia</i> , <i>Keraudrenia nephrosperma</i> , <i>K. velutina</i> subsp. <i>elliptica</i> , <i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i> , <i>Sida</i> sp. <i>Excedentifolia</i> (J.L. Egan 1925), <i>Senna glutinosa</i> subsp. <i>glutinosa</i> and <i>S. notabilis</i> under 1 m.
<b>Understorey</b>	
Hummock Grasses	Open Hummock Grassland of <i>Triodia pungens</i> , <i>T. angusta</i> and <i>T. melvillei</i> to 1 m.
Tussock Grasses	Tussock Grassland of <i>Themeda triandra</i> , <i>Eulalia aurea</i> and <i>Cymbopogon fallax</i> to 0.5 m.

**Vegetation Condition**

**Condition Rating:**

Good to Pristine.

**Disturbances:**

Cattle, horses, flooding and introduced flora.

**Average Fire Age:**

Young to Old.



**Broad Floristic Formation: *Keraudrenia* Low Shrubland**

**Vegetation Association: 3a**

Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on red-brown loam with a covering of cobbles and pebbles on Hill Slopes.



**Area:** 636.6 ha

**Quadrats Sampled**

Ophthalmia: 18, 08, 24, 02, 16, 22

**Landform Description**

**Location and Landform:** This association is located within the south facing hill slopes in the northern section of the project area.  
**Geology:** Colluvium (after Geological Survey of Western Australia 1990).  
**Soil Attributes:** Red-brown loam with cobbles and pebbles covering the soil surface.  
**Litter Cover:** 1% Logs, 1% Twigs and 1%% Leaves. **Bare Ground:** 30 - 70%.

**Vegetation Structure and Floristics**

The Low Shrubland of *Keraudrenia velutina* subsp. *elliptica* is a diagnostic of this association.

Stratum	Key Characteristics
<b>Overstorey</b>	
Canopy Layer	Very Open Mallees of <i>Eucalyptus gamophylla</i> , <i>E. kingsmillii</i> subsp. <i>kingsmillii</i> and <i>E. repullulans</i> between 2 - 4 m.
<b>Midstorey</b>	
Middle Shrub Layer	Scattered Shrubs of <i>Acacia aneura</i> var. <i>intermedia</i> , <i>Acacia pachyacra</i> and <i>Acacia kempeana</i> between 1 - 3 m.
Lower Shrub Layer	Low Shrubland of <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> , <i>Rulingia luteiflora</i> and <i>Indigofera monophylla</i> to 0.8m.
<b>Understorey</b>	
Hummock Grasses	Open Hummock Grassland of <i>Triodia melvillei</i> and <i>T. sp.</i> Shovelanna Hill (S. van Leeuwen 3835) to 0.5 m.

**Vegetation Condition**

**Condition Rating:** Young to Moderate  
**Disturbances:** Fire, Cattle, Nearby Tracks.  
**Average Fire Age:** Young to Old.

### 3.2.6 Vegetation Condition

Vegetation condition within the project area ranged between Good to Pristine (Figure 8). The majority of the vegetation was categorised as Pristine or Excellent. Small areas were considered to be completely degraded such as tracks and drill pads however, as these were minor they were not mapped.

The majority of the hills and plains were considered to be in Pristine condition with disturbances in these areas from tracks and drill pads. The floodplains and drainage lines were considered to be in poorer condition and were rated as Good to Excellent. Disturbances in these areas include introduced species and trampling and grazing from cattle and horses.

Fire age within the project area ranged from Recent (within the last two years since the last fire) to Very Old (eight to 12 years since the last fire). Large areas in the west, north-west and north had fire ages of Young and were burnt during 2006.

### 3.2.7 Vegetation of Conservation Significance

Eight vegetation associations were identified as occurring within the project area. None of the vegetation associations recorded in the project area are listed as Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, as Environmentally Sensitive Areas under the *Environmental Protection Act 1986 (WA)*, or as Priority Ecological Communities by the Department of Environment and Conservation.

### 3.2.8 Regional Representation of Vegetation Associations

Beard (1975) mapped two vegetation types in the project area (Table 5). This can be correlated to mapping by Shepherd *et al.* (2001) who attempted to determine the current extent of these vegetation types.

The ENV vegetation associations have been generally correlated with the Beard (1975) broad vegetation types (Table 5). Differences exist with the terminology used in the descriptions as they are based on different methods of categorising and characterising vegetation types, and spatial scale of the analysis (*i.e.* region vs. local scale).

The vegetation types mapped by Beard (1975) occurring in the project area have a large distribution especially within the Eastern/Central Pilbara region. In addition, as shown in Table 5, they are considered to exist at almost 100% of their pre-European extent as per Shepherd *et al.* (2001) and DAFWA (2007b). Vegetation types that have over 50% of their pre-European extent are considered of 'Least Concern' as per the Department of Natural Resources and Environment (2002).

**Table 5:** Regional Representation of Vegetation Types in the Project Area

	Pre-European area (ha) <sup>3</sup>	Current extent (ha) <sup>3</sup>	Remaining (%) <sup>3</sup>	Pre-European % in IUCN Class I-IV Reserves <sup>3</sup>	Conservation Status <sup>4</sup>	ENV Vegetation Associations
IBRA Bioregion – Pilbara	17,804,187	17,794,646	~99.9	6.3	Least Concern	N/A
<b>Vegetation Type (Beard 1975) Western Australia</b>						
18	19,892,305	19,890,195	99%	2.13	Least Concern	1e
82	2,565,901	2,565,901	100%	10.24	Least Concern	3a
<b>Vegetation Type IBRA Pilbara Bioregion</b>						
18	676,557	676,557	100	16.8	Least Concern	1e
82	2,563,583	2,563,583	100	10.25	Least Concern	3a

Four land systems as described by van Vreeswyk et al. (2004) occur in the project area; the Platform, Rocklea, Spearhole and Table Land land systems (Table 6).

The Rocklea land system covers a large portion of the Pilbara region (22,993 km<sup>2</sup> and 12.7%) and is geographically widespread. The regional representation value of this land system is unlikely to be significantly impacted by disturbances associated with the project area. The Platform and Spearhole land systems cover a smaller proportion of the Pilbara region (0.9% and 0.7% respectively), both are geographically widespread and will not be significantly impacted by disturbances associated with the project. The Table Land land system has a restricted distribution of 77 km<sup>2</sup> and 0.04%. Within the project area this land system supports the vegetation association *Triodia* Hummock Grassland 1d with approximately 0.3 km<sup>2</sup> in the project area. As this unit is restricted in distribution it may be impacted upon by the proposed development.

<sup>3</sup> Shepherd *et al.* (2002) and DAFWA (2007b)

<sup>4</sup> Department of Natural Resources and Environment (2002)

**Table 6:** Descriptions of Unit Types of Land Systems (van Vreeswyk *et al.* 2004) within the Project Area.

Land System	Description	Extent within Pilbara Region	Proportion of the Pilbara Region	Land System Units
Platform	Dissected slopes and raised plains supporting hard Spinifex grasslands.	1,570 km <sup>2</sup>	0.9%	<p>25% Stony upper plains with <i>Acacia</i> species shrubs over <i>Triodia wiseana</i> and <i>Triodia</i> species.</p> <p>60% Dissected slopes with <i>Eucalyptus leucophloia</i> over scattered acacia species shrubs and <i>Triodia plurinervata</i> (<i>T. sp.</i> Shovellana Hill?) and <i>T. wiseana</i>.</p> <p>15% Drainage floors 20 to 50 metres wide, channelled or not, with <i>Acacia citrinoviridis</i>, <i>Acacia tumida</i> and <i>Acacia</i> species over low shrubs <i>Senna</i> species, <i>Ptilotus obovatus</i> and <i>Corchorus walcottii</i> over <i>Triodia pungens</i> (<i>T. epactia</i>).</p>
Rocklea	Basalt hills, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft Spinifex) grasslands.	22,993 km <sup>2</sup>	12.7%	<p>65% Hills, ridges, plateaux and upper slopes with scattered shrubs including <i>Acacia inaequilatera</i> and <i>Senna</i> species over hummock grassland <i>Triodia wiseana</i>, <i>T. species</i> (hard Spinifex) and <i>T. pungens</i> (<i>T. epactia</i>).</p> <p>15% Lower slopes with scattered shrubs including <i>Acacia inaequilatera</i> and <i>Senna</i> species over hummock grassland <i>Triodia wiseana</i>, <i>T. species</i> (hard Spinifex) and <i>T. pungens</i> (<i>T. epactia</i>).</p> <p>10% Stony plains and interfluves with scattered shrubs <i>Acacia inaequilatera</i> over <i>Triodia wiseana</i> and occasional <i>T. pungens</i> (<i>T. epactia</i>). Some grassy shrublands.</p> <p>1% Gilgai plains with tussock grasslands of <i>Astrebla pectinata</i>, <i>Eragrostis xerophila</i> and grass species.</p> <p>4% Upper drainage lines with occasional <i>Corymbia hamersleyana</i> and scattered shrubs over hummock grassland of <i>Triodia wiseana</i> or <i>T. pungens</i> (<i>T. epactia</i>).</p> <p>5% Drainage floors and channels with <i>Acacia</i> and <i>Eucalyptus</i> shrubland or woodland over numerous undershrubs, hummock and tussock grasslands.</p>

Land System	Description	Extent within Pilbara Region	Proportion of the Pilbara Region	Land System Units
Spearhole	Gently undulating hardpan plains supporting groved mulga shrublands and hard Spinifex.	1,270 km <sup>2</sup>	0.7%	<p>15% Low rises with scattered tall shrublands <i>Acacia aneura</i>, <i>A. pruinocarpa</i> and <i>Acacia</i> species over <i>Ptilotus</i> and <i>Senna</i> species, with or without hummock grasses <i>Triodia</i> species (hard Spinifex).</p> <p>55% Gravelly hardpan plains with scattered to closed tall shrublands <i>Acacia aneura</i>, <i>A. catenulata</i> over <i>Eremophila</i> and <i>Ptilotus</i> species with or without hummock grasses <i>Triodia</i> species (hard Spinifex).</p> <p>15% Groves on hardpan plains with closed woodlands to tall shrubland <i>Acacia aneura</i>, <i>A. catenulata</i> and <i>Acacia</i> species over numerous low shrubs of <i>Eremophila</i>, <i>Ptilotus</i> and <i>Sida</i> species and occasional tussock grasses.</p> <p>10% Slopes adjacent to hardpan plains, spurs and interfluves with scattered <i>Corymbia hamersleyana</i>, <i>Eucalyptus socialis</i> and shrubs of <i>Acacia</i> species over hummock grassland <i>Triodia wiseana</i>.</p> <p>5% Drainage lines with scattered to close woodlands or tall shrublands of <i>Eucalyptus</i>, <i>Corymbia</i> and <i>Acacia</i> species over low shrubs and hummock (hard Spinifex) and tussock grasses.</p>
Table Land	Low calcrete plateaux, mesas and low plains supporting mulga and cassia shrublands and minor spinifex grasslands	77 km <sup>2</sup>	0.04%	<p>50% Calcrete mesas, plateaux and hills with scattered tall shrublands of <i>Acacia aneura</i> and <i>Acacia</i> species over low shrubs <i>Senna artemisioides</i> subsp. <i>oligophylla</i> and <i>Ptilotus obovatus</i> and hummock grassland of <i>Triodia wiseana</i>.</p> <p>25% Footslopes, gentle to steep slopes with very scattered shrublands <i>Acacia xiphophylla</i> (Snakewood), <i>Senna</i> and <i>Eremophila</i> species and <i>Ptilotus obovatus</i> and hummock grassland <i>Triodia wiseana</i>.</p> <p>15% Lower plains downslope from units above, with scattered tall shrublands of <i>Acacia aneura</i> and <i>Acacia</i> species over <i>Senna artemisioides</i> subsp. <i>oligophylla</i>, <i>Eremophila</i> species and <i>Ptilotus obovatus</i>.</p>

Land System	Description	Extent within Pilbara Region	Proportion of the Pilbara Region	Land System Units
				<p>5% Drainage floors between calcrete plateaux with scattered tall shrubs of <i>Acacia aneura</i> and <i>Acacia</i> species over low shrubs <i>Senna</i> species, <i>Rhagodia eremaea</i> and <i>Ptilotus obovatus</i>.</p> <p>4% Channels and creeklines, major with close, tall shrublands or woodlands of <i>Acacia aneura</i> and <i>Acacia</i> species over numerous low shrubs and patchy grasses.</p> <p>1% Drainage Foci on calcrete mesas, plateaux and hills with scattered tall shrublands of <i>Acacia aneura</i> over low shrubs mostly <i>Senna artemisioides</i> subsp. <i>oligophylla</i> and tussock grasses including <i>Eragrostis xerophila</i> and <i>Eriachne flaccida</i>.</p>



## 4 FAUNA RESULTS

### 4.1 VARIABLES INFLUENCING THE FAUNA SURVEY

It is important to note the variables associated with individual surveys, which are often difficult to predict, as is the extent to which they influence survey outcomes. Survey variables of the fauna survey are detailed in Table 7.

**Table 7:** Variables Associated with the Fauna Survey

Variable	Impact on Survey Outcomes
Access problems	All of the Ophthalmia project area was accessible and surveyed to the appropriate level.
Experience levels	<p>The scientists who undertook these surveys were practitioners suitably qualified in their respective fields.</p> <p>Ophthalmia Fauna Assessment (2010 survey)</p> <ul style="list-style-type: none"> <li>• Field Staff: Mike Brown (Environmental Biologist) and John Trainer (Environmental Biologist);</li> <li>• Data Interpretation and Reporting: John Trainer.</li> </ul>
Timing, weather, season	<p>The survey was undertaken between the 12 and 17 May 2010. The area had received 75 mm of rain in the three months preceding the survey (February 2010-April 2010) (BoM 2010). The average rainfall for this same period is 137.3 mm (BoM 2010).</p> <p>The mean daily maximum temperature for May was 27.3°C, with mean overnight temperature being 11.6°C (BoM 2010). Daytime temperatures during the survey were between 23.5°C and 31°C, with night temperatures ranging from 6.4°C to 14°C.</p> <p>These weather conditions were not likely to limit the activity of any faunal group.</p>
Scope: sampling methods/ intensity	<p>A Level One survey was undertaken. As such, many species that occur in the project area would not have been observed during the survey, particularly small ground-dwelling fauna that are normally recorded via trapping.</p> <p>All conservation significant species previously recorded in the area have been considered. Based on the habitat present, those species deemed to potentially occur in the project areas have been addressed in this report, and the potential impacts upon them discussed in Section 4.3.</p>
Sources of information	At the bioregion level, the Pilbara has been relatively well studied in recent years. Numerous flora and fauna surveys have been undertaken in the vicinity of the project area as part of environmental impact assessment processes.

Variable	Impact on Survey Outcomes
Completeness	As the fauna survey was a Level One survey many species that occur in the project area would not have been observed, however all conservation significant species deemed to potentially occur in the project areas have been addressed.

## 4.2 FAUNA HABITATS

The project area consists of seven habitat types: Riverine, Minor Drainage Line, Breakaway, Alluvial Plain, Stony Plain, Hill Slope and Hill Crest (Table 8 and Figure 9). As part of the field survey a minimum of three of each habitat type was assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna assemblages (Appendix I).

The project area contains areas that have been cleared or developed (Cleared/Developed); these areas provide little to no habitat value and are principally made up of cleared areas such as drill pads, laydowns and drill tracks.

**Table 8:** Major Habitat Types of the Ophthalmia Project Area.

Habitat Type	Habitat Value	Habitat Size (ha)
Riverine	High	392.5 ha
Minor Drainage Line	Moderate	570.3 ha
Breakaway	Moderate	16.4 ha
Alluvial Plain	Moderate	1253.5 ha
Stony Plain	Moderate	1907.8 ha
Hill Slope	Low	4064.5 ha
Hill Crest	Low	122.9 ha
Cleared/Developed	n/a	
<b>Total</b>		<b>8327.9 ha</b>



### **Riverine**

The Riverine habitat consists of large ephemeral creeks and rivers that bisect the landscape. This habitat type contains a high diversity of microhabitats with logs, debris, tree hollows, soft soils, dense vegetation and understory being present. Conservation significant fauna that may occur in this habitat type is the Pilbara Olive Python (*Liasis olivaceus barroni*), Eastern Great Egret (*Ardea modesta*), Rainbow Bee-eater (*Merops ornata*) and Star Finch (*Neochmia ruficauda clarescens*). The Riverine habitat also provides an ecological corridor for fauna to travel to other locations. It is due to the microhabitat complexity and number of fauna that it supports that the Riverine habitat is considered of High habitat value.

### **Minor Drainage Line**

The Minor Drainage Line habitat is a linear habitat that often runs off the hill and onto the surrounding plains. The vegetation in this habitat type has moderate complexity, with scattered trees of *Corymbia hamersleyana*, *Corymbia deserticola* subsp. *deserticola*, and occasionally Mulga (*Acacia aneura*) over sparse shrubs of *Petalostylis labicheoides* and *Acacia pruinocarpa* over mixed grasses of *Themeda triandra*, *Triodia* species and *Cymbopogon* species. The Minor Drainage Line habitat has a moderate diversity of microhabitats with logs, debris, tree hollows, on occasional soft soils being present in this habitat type. In addition to the microhabitats, this habitat also acts as a corridor utilised by some fauna when dispersing. Conservation significant fauna likely to occur in this habitat type is the Rainbow Bee-eater (*Merops ornata*). The Minor Drainage Line is considered to be of moderate habitat value.

### **Breakaway**

The Breakaway habitat type is strongly associated with areas of rocky hills. It is a section of hill crest that has fallen away to produce a steep cliff. The vegetation in this habitat type is of moderate complexity, with Open woodlands of Snappy Gum (*Eucalyptus leucophloia* subsp. *leucophloia*) and *Corymbia ferriticola* subsp. *ferriticola* over sparse shrubs of Mulga (*Acacia aneura*), *Gossypium* species and other *Acacia* species. The Breakaway habitat has a high diversity of microhabitats such as overhangs, cracks, crevices, and caves provided by the outcropping of rocks, logs, debris and hollows provided by the vegetation. Conservation significant fauna that, if present potentially utilise this habitat type are the Pilbara Olive Python (*Liasis olivaceus barroni*), Peregrine Falcon (*Falco peregrinus*) and Grey Falcon (*Falco hypoleucos*). The Pilbara Olive Python may utilise cracks and crevices for shelter and foraging at the base of breakaways and the Grey Falcon and Peregrine Falcon may temporarily perch in this habitat when hunting for prey. The Ghost Bat (*Macroderma gigas*) and Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*) may forage in the area close to the sides of breakaways, but there are no caves suitable for roosting for these species. This habitat type was deemed as having a moderate habitat value.

### **Alluvial Plain**

The Alluvial Plain habitat type usually occurs in the low laying areas of the project area. This habitat type has complex vegetation with a Woodland of Mulga (*Acacia aneura*) over a midstorey of sparse *Acacia* species over mixed grasses of *Aristida* species and *Triodia* species. A moderate diversity of microhabitats are present, with tree hollows, logs, leaf litter and debris all provided by the vegetation structure. In addition to these there are also soils suitable for digging and

burrowing animals. Conservation significant fauna likely to utilise this habitat type include the Australian Bustard (*Ardeotis australis*) and the Bush Stone-curlew (*Burhinus grallarius*). This habitat type was deemed as having a moderate habitat value.

### ***Stony Plain***

The Stony Plain habitat is often associated with lower hill slopes and is located in the North-west and central regions of the project area. This habitat has simple vegetation complexity with an Open Woodland of Snappy Gum (*Eucalyptus leucophloia* subsp. *leucophloia*), and Mulga (*Acacia aneura*), with areas of scattered *Acacia pruinocarpa*. Mid-storey primarily consists of *Eucalyptus gamophylla* with an understorey of mixed grasses of *Triodia* species and *Cymbopogon* species. Microhabitat diversity is low, with logs, debris and litter being scarce. The substrate is more favourable for burrowing animals than the Hill Slope habitat, but not as soft as the soils associated with the Alluvial Plain. Conservation significant fauna that potentially utilise this habitat are the Australian Bustard (*Ardeotis australis*), and the Bush Stone-curlew (*Burhinus grallarius*), with marginal habitat provided for the Western Pebble-mound Mouse (*Pseudomys chapmani*). The Stony Plain habitat type has been given a moderate habitat value.

### ***Hill Slope***

The Hill Slope habitat, like the Breakaway, is closely associated with the hilly areas of the project area. It is characterised by stony soils with simple vegetation structure. The vegetation present consists primarily of scattered Snappy Gum (*Eucalyptus leucophloia* subsp. *leucophloia*) over *Triodia* species. Microhabitats in this habitat type are simple with few vegetation associated niches available and hard pebbly soils unsuitable to most burrowing fauna. Scattered logs and few hollows are provided by the scattered *Eucalyptus leucophloia* subsp. *leucophloia*, with leaf litter and debris being scarce. The Western Pebble-mound Mouse (*Pseudomys chapmani*) is the only conservation significant fauna likely to utilise this habitat type exclusively. This mouse species makes use of the small surface rocks for mound building and is considered to be a specialist to habitats with this attribute. However, due to this habitat having poor vegetation complexity, low diversity of microhabitats and being utilised by few conservation significant fauna this habitat is considered to be of low habitat value.

### ***Hill Crest***

The Hill Crest habitats are located atop of the larger hills of the project area. This habitat type has a vegetation structure similar to that of the Hill Slope habitat, with scattered Snappy Gum (*Eucalyptus leucophloia* subsp. *leucophloia*) over *Triodia* species. There is a low diversity of microhabitats in this habitat type with few logs, debris, and hollows provided by the vegetation. The soil is hard and unsuitable for burrowing fauna as the bedrock is close to the surface and exposed in some areas. Even though the bedrock is exposed it tends not to provide niche habitats in the form of cracks and crevices. Very few conservation significant fauna utilise the Hill Crest habitat, with only marginal habitat provided for the Western Pebble-mound Mouse (*Pseudomys chapmani*). This habitat type was deemed as having a low habitat value.

### 4.3 FAUNA ASSEMBLAGES

Fauna assemblages in the project area have been compiled from surveys conducted within and surrounding the project area (see Appendix O) and records from DEC threatened fauna database searches, *NatureMap* (DEC 2010b), and DEWHA Protected Matters Search Tool (DEWHA 2010).

A total of 304 fauna have been previously recorded within the vicinity of the project, this includes eight amphibian species, 109 reptile species, 139 bird species and 48 mammal species. Many of these species are unlikely to occur in the project area on a regular basis since these records are from a large area encompassing a wide range of habitats. Furthermore small common ground dwelling reptile and mammal species tend to be habitat specific and bird species that potentially occur, more often than not occur on a transitory basis.

All fauna recorded previously in the region are listed in Appendix O, with conservation significant fauna potentially occurring and or previously recorded for the project area listed in Table 9.

#### 4.3.1 Amphibians

Eight species of amphibians have been previously recorded in the general vicinity of the project area, with two amphibian species being recorded in the Ophthalmia Exploration Lease Fauna Assessment (ENV 2007b) (Appendix O). No amphibian species were recorded in the current survey of the Ophthalmia project area.

The two species of amphibian that were previously recorded during the Ophthalmia Exploration Lease Fauna Assessment (ENV 2007b) were the Little Red Tree Frog *Litoria rubella*, and the Mains frog *Cyclorana maini*. The Little Red Tree Frog can usually be found in trees and shrubs besides watercourses (Cogger 2000); in the project area these species may be found within the Minor Drainage Line habitat type, particularly in low lying areas where water may pool during and after rain events. The Mains Frog is a burrowing frog and can be found in the Alluvial Plain habitat types and emerge after significant rain events (Cogger 2000, Wilson and Swan 2008).

#### 4.3.2 Reptiles

One hundred and nine species of reptiles have been previously recorded in the general vicinity of the project area, with 22 reptilian species being recorded in the Ophthalmia Exploration Lease Fauna Assessment (ENV 2007b) and seven species being recorded in the current survey of the Ophthalmia Project area (Appendix O). In total 26 species have been recorded within the lease area.

Common reptiles recorded in the Alluvial Plain habitats of the project area include the Central Military Dragon (*Ctenophorus isolepis*), Long-nosed Dragon (*Amphibolurus longirostris*) and Variegated Tree Dtella (*Gehyra variegata*). Common reptiles recorded in the Low Hill habitats of the project area include the Ring-tailed Rock Dragon (*Ctenophorus caudicinctus caudicinctus*) and Spotted Rock Dtella (*Gehyra variegata*). Common reptiles recorded in all habitat types of the Survey area include the Bynoe's Gecko (*Heteronotia binoei*), *Ctenotus helena* and Rock Ctenotus (*Ctenotus saxatilis*). None of these reptilian species are specially protected by legislation.

### 4.3.3 Birds

One hundred and thirty nine species of birds have been previously recorded in the general vicinity of the project area, with 84 avian species being recorded in the Ophthalmia Exploration Lease Fauna Assessment (ENV 2007b) and 34 species being recorded in the current survey of the Ophthalmia project area (Appendix O). In total 86 have been recorded within the lease area.

Common raptors recorded in the project area include the Whistling Kite (*Haliastur sphenurus*), Nankeen Kestrel (*Falco cenchroides*) and Brown Falcon (*Falco berigora*). Common pigeons / doves recorded in the project area include the Crested Pigeon (*Ocyphaps lophotes*), Spinifex Pigeon (*Geophaps plumifera*) and Diamond Dove (*Geopelia cuneata*). Common parrots recorded in the project area include the Galah (*Cacatua roseicapilla*), Australian Ringneck (*Barnardius zonarius*) and Budgerigar (*Melopsittacus undulatus*). Common nocturnal birds recorded in the project area include the Spotted Nightjar (*Eurostopodus argus*) and the Australian Owlet-nightjar (*Aegotheles cristatus*).

Common small passerine birds recorded in the project area include the Variegated Fairy-wren (*Malurus lamberti*), White-winged Fairy-wren (*Malurus leucopterus*), Weebill (*Smicronis brevirostris*), Red-capped Robin (*Petroica goodenovii*), Magpie-lark (*Grallina cyanoleuca*), Grey Fantail (*Rhipidura fuliginosa*), Black-faced Woodswallow (*Artamus cinereus*) and Zebra Finch (*Taeniopygia guttata*). Common honeyeaters recorded in the project area include the Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*), Yellow-throated Minor (*Manorina flavigula*), Singing Honeyeater (*Lichenostomus virescens*), White-plumed Honeyeater (*Lichenostomus penicillatus*) and Brown Honeyeater (*Lichmera indistincta*).

Other common birds recorded in the project area include the Red-backed Kingfisher (*Todiramphus pyrrhopygia*), Crested Bellbird (*Oreoica gutturalis pallescens*), Rufous Whistler (*Pachycephala rufiventris*), Grey Shrike-thrush (*Colluricincla harmonica*), Black-faced Cuckoo-shrike (*Coracina novaehollandiae*), White-winged Triller (*Lalage tricolor*), Pied Butcherbird (*Cracticus nigrogularis*), Torresian Crow (*Corvus orru*) and Richards Pipit (*Anthus novaeseelandiae*).

Many of these species generally occur (or are more common) in the Alluvial Plain habitat type. The occurrence of this habitat type in the Pilbara is often characterised by higher tree density compared with other habitat types, in particular rocky scree dominated substrates. Approximately 15.1% of the project area is Alluvial Plains allowing the site to potentially support a greater diversity of avian fauna than for other habitat types.

### 4.3.4 Mammals

Forty-eight species of mammals have previously been recorded in the general vicinity of the Project area, with 13 mammalian species being recorded in the Ophthalmia Exploration Lease Fauna Assessment (ENV 2007b) and 16 species being recorded in the current survey of the Ophthalmia Project area (Appendix O). Eight species of bat were recorded in the project area using AnaBat recordings, the location of these is displayed in Figure 10.

The Euro (*Macropus robustus* subsp. *erubescens*) and the Red Kangaroo (*Macropus rufus*) are the most common marsupials recorded in the project area. Common bats recorded in the project area include Gould's Wattled Bat (*Chalinolobus gouldii*), the Little Broad-nosed Bat (*Scotorepens greyii*) and Finlayson's Cave Bat (*Vespadelus finlaysoni*). A common native rodent recorded in the project area is the Common Rock-rat (*Zyomys argurus*).

Eight species of introduced mammals have previously been recorded in the general vicinity of the Project area: the House Mouse (*\*Mus musculus*), European Rabbit (*\*Oryctolagus cuniculus*), Fox (*\*Vulpes vulpes*), Feral Cat (*\*Felis catus*), Donkey (*\*Equus asinus*), Horse (*\*Equus caballus*), Camel (*\*Camelus dromedarius*) and Cattle (*\*Bos taurus*).

#### **4.4 CONSERVATION SIGNIFICANT FAUNA**

From the desktop review of previous surveys conducted in the area and database searches a list of previously recorded species has been compiled (Appendix O). Previously recorded conservation significant species within the vicinity of the project area are listed in Table 9.

**Table 9:** Conservation Significant Fauna Potentially Occurring in the Project Area

Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
<b>REPTILES</b>				
<i>Ramphotyphlops ganeii</i>	P1	There are few records of the species in the Pilbara, making it one of the rarest reptiles for the region, and little is known of its habitat requirements. Blind snakes are typically very hard to detect during biological surveys, yet more common blind snakes such as <i>Ramphotyphlops grypus</i> are typically recorded at least once per trapping survey. <i>Ramphotyphlops ganeii</i> occurs in rocky or stony soils (Wilson and Swan 2008) which suggests it should occur broadly across the region.	Suitable habitat for this species occurs in the project area, although limited records make habitat relevance hard to assess. However a recent recording was made by Outback Ecology (2009) within an alluvial floodplain. This habitat type occurs in the Survey area, so whilst this species is unlikely to shelter or breed in the Survey area, it may disperse and forage through the Survey area on an infrequent basis.	Possible
Pilbara Olive Python	VU,S1	Olive Pythons are found in a range of habitats, including drier areas of woodland, rocky gorges, gullies and around watercourses (Wilson and Swan 2008). Pearson (2003) has reported that Pilbara Olive Pythons are widespread across the Pilbara, with many significant populations remaining.	This species may utilise the drainage lines / creek lines of the project area in a transitory nature when conditions are suitable. This species could also be found around the Breakaways of the project area where there are cracks and crevices to shelter in.	Possible
<b>BIRDS</b>				
Eastern Great Egret	Mi	The Eastern Great Egret occurs in the Kimberley, Pilbara, and on the west coast from the Murchison River south, throughout the south-west, and east to Cape Arid. It inhabits mostly shallow fresh lakes, pools in rivers, lagoons, lignum swamps, clay pans and samphire flats, large dams and sewage ponds. It also inhabits shallow saltwater habitat such as mangrove creeks, tidal pools, samphire swamps and salt work ponds. It breeds colonially at wooded swamps and river pools, nesting in various riparian trees.	This species may utilise the Riverine habitats of the project area but only when surface water is present.	Possible

Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
Grey Falcon	P4	The Grey Falcon is generally regarded as a rare bird in Australia, although it occurs on the Fortescue River and has been recorded within the Packsaddle Range. (Johnstone and Storr 1998). They are a difficult species to study, having a strongly transient nature. The Grey Falcon nests in River Gum and Coolabah trees and feeds mostly on birds (Johnstone and Storr 1998).	Possible nesting habitat occurs for this species in the large trees found in the Riverine habitat of the project area.	Possible
Peregrine Falcon	S4	The Peregrine Falcon is uncommon but wide-ranging across Australia. They occur mainly along coastal cliffs, rivers and ranges as well as wooded watercourses and lakes. The Peregrine Falcon nests primarily on cliffs, granite outcrops and quarries, and feed mostly on birds (Johnstone and Storr 1998).	There are no suitable breeding sites in the project area for this species. Although it may forage in this area as part of a wider home range.	Possible
Australian Bustard	P4	The Australian Bustard is typically widespread and nomadic, but locally scarce. This species is distributed across most of WA, although is most prevalent in grasslands, especially tussock grasses, arid scrub and dry open woodlands (Morcombe 2000). The abundance of this species varies according to habitat and season, in particular the abundance of grasshoppers. Habitat loss has led to a decline in this species in the Pilbara (Johnstone and Storr 1998).	The Alluvial and Stony Plains of the project area are ideal habitats for the Australian Bustard. There were three individuals recorded in the project area during this survey.	Recorded
Bush Stone-curlew	P4	The Bush Stone-curlew inhabits dry open woodlands with groundcover of small sparse shrubs, grass or litter of twigs. It tends to avoid dense forest, closed-canopy habitats (Morcombe 2000). The species generally occurs near a watercourse or swamp (Geering <i>et al.</i> 2007). Bush Stone-curlews are locally rare because of predation by foxes - the main concern for their regional decline (Johnstone and Storr 1998).	The Alluvial and Stony Plains of the project area are the preferred habitat for this species.	Possible

Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
Night Parrot	EN, S1	The Night Parrot ( <i>Pezoporus occidentalis</i> ) is a very cryptic bird species, with few records of it since the 1880s, although it is thought to persist inland. It inhabits inland plains, around sparsely wooded spinifex near water (Johnstone and Storr 1998). Most recently, a confirmed live sighting of the Night Parrot was reported from the proposed Fortescue Metals Group rail corridor at Minga Well near the Fortescue Marsh (Bamford Consulting Ecologists 2005). Subsequent species-specific searches have failed to find any further evidence of this species at this location (Terrestrial Ecosystems 2010).	The lack of a permanent water source and rarity of previous records makes this site unsuitable for the Night Parrot.	Highly Unlikely
Fork-tailed Swift	Mi	The Fork-tailed Swift is a summer migrant (October-April) to Australia. This species is an aerial species, which forages high above the tree canopy and rarely lower so is independent of terrestrial habitats. It usually occurs in flocks of up to 2000 and is often seen accompanying Tree Martins and Masked Woodswallows (Johnstone and Storr 1998).	As this species forages high in the airspace it is reasonably independent of the ground habitat.	Possible





Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
Rainbow Bee-eater	Mi	The Rainbow Bee-eater is a common and widespread species in Western Australia. It occurs throughout Western Australia, except the drier interior of the State and the far south-west. It occurs in lightly wooded, often sandy country, preferring areas near water. The Rainbow Bee-eater feeds on airborne insects, and nests throughout its range in Western Australia in burrows excavated in sandy ground or banks, often at the margins of roads and tracks (Johnstone and Storr 1998).	The Minor Drainage Lines of the project area contains suitable habitat for the Rainbow Bee-eater. Three individuals of this species were observed during the survey.	Recorded
Star Finch	P4	The western subspecies of the Star Finch is confined to the Pilbara region of WA (Pizzey and Knight 2007). The species occurs in grasslands with sparse vegetation, and feeds mainly on grass seeds and some small insects (Johnstone and Storr 2004). Like most finches this species needs regular water, so is likely to occur near permanent water for most of the season then disperse out to a wider area during and after the wet season when ephemeral pools have water.	This species may utilise the Riverine habitats and their surrounds only after significant rainfall allows them to disperse from their usual habitats.	Possible
<b>MAMMALS</b>				
Northern Quoll	EN, S1	The Northern Quoll occurs mainly in areas of open eucalypt woodland within 200 km of the coast, although it has been recorded in a range of vegetation types, and is known to den in rock crevices. It favours rocky areas, taking refuge in rock crevices, and utilises gullies and drainage lines (van Dyck and Strahan 2008). The Northern Quoll may be locally common, but its former range has retracted considerably (van Dyck and Strahan 2008). There are no known records from the vicinity of the project area despite the number of surveys undertaken.	There is limited suitable habitat in the project area for this species. The breakaways of the project area do not contain any caves suitable as den sites. Furthermore there were no signs of any tracks, scats or traces for this species recorded within the project area.	Unlikely

Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
Ghost Bat	P4	The Ghost Bat ( <i>Macroderma gigas</i> ) occurs in a wide variety of habitats, and require an undisturbed cave, deep fissure or disused mine shaft in which to roost. It is patchily distributed across Australia, and is sensitive to disturbance. Colonies range in size from 400-1000 individuals (van Dyck and Strahan 2008). The Ghost Bat inhabits areas of open woodland (Churchill 2008) like that found in the project area.	There are no caves suitable for roosting sites in the project area. This species may forage over parts of the project area sporadically as part of a larger home range.	Possible
Pilbara Leaf-nosed Bat	VU,S1	The Pilbara Leaf-nosed Bat requires deep caves or disused mine shafts in which to roost (van Dyck and Strahan 2008), at least in the dry season. These bats have been recorded in isolated populations in the Pilbara, and are present only where suitable roosting niches are available). They are generally sparsely distributed. The Pilbara Leaf-nosed Bat inhabits areas of open woodland (Churchill 2008) like that found in the project area.	There are no caves suitable for roosting sites in the project area. This species may forage over parts of the project area sporadically as part of a larger home range.	Possible
Short-tailed Mouse	P4	The Short-tailed Mouse ( <i>Leggadina lakedownensis</i> ) occurs in a range of habitat types on seasonally inundated sandy-clay soils (van Dyck and Strahan 2008). In the Pilbara it occurs on stony hummock grassland (Menkhorst and Knight 2004). It is generally rare, with scattered populations, and very little is known of its biology (van Dyck and Strahan 2008). The Lakeland Downs Mouse is generally rare for the local area with only minimal records existing for this species.	There is suitable habitat present, although limited records of this species in the surrounding areas suggest it is unlikely to occur.	Unlikely
Western Pebble-mound Mouse	P4	The Western Pebble-mound Mouse is restricted to the Pilbara, where it is recognized as an endemic species. Abandoned mounds to the east of its current range indicate a decline in distribution. Abandoned mounds in disturbed areas suggest that the species is under threat by grazing and mining activities. The construction of extensive pebble mounds, built from	The Hill Slope habitat provides suitable habitat for this species. In addition to this the Hill Crest and Stony Plain habitat type provides a marginal habitat for this species.	Recorded

Conservation Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood
		<p>small stones, which typically cover areas from 0.5-9.0 square meters, is characteristic of this species. Mounds are restricted to suitable-class stones, and are usually found on gentle slopes and spurs.</p> <p>Approximately 12 pebble mounds with varying age grades were recorded across the project area. One pebble mound was active with the remaining considered to be recently inactive or extinct (Anstee 1996). No individuals were captured all evidence of this species was secondary. This species has been known to recolonise extinct pebble mounds.</p>		

KEY:

- S Scheduled under the *WC Act 1950*. Schedule 1 and 2 fauna are also protected by the *EBPC Act 1999*.
- P Listed as Priority by the DEC.
- Mi Listed as Migratory under the *EBPC Act 1999*.
- Vu Listed as Vulnerable under the *EBPC Act 1999*.
- En Listed as Endangered under the *EBPC Act 1999*.
- Recorded Recorded during the field survey or site reconnaissance.
- Likely Suitable habitat is present in the project area and the project area is in the species' known distribution.
- Possible Limited or no suitable habitat is present in project area but is nearby, the species has good dispersal abilities and is known from the general area.
- Unlikely No suitable habitat is present in project area but is nearby, the species has poor dispersal abilities, but is known from the general area; or suitable habitat is present, however the project area is outside of the species' known distribution.
- Highly Unlikely The species has poor dispersal abilities, no suitable habitat is present, and the species is uncommon; or the species is thought to be locally extinct.



#### 4.4.1 Recorded Species

##### **Australian Bustard (*Ardeotis australis*)**

The Australian Bustard is typically widespread and nomadic, but locally scarce. This species is distributed across most of Western Australia, although it is most prevalent in grasslands, especially tussock grasses, arid scrub and dry open woodlands (Morcombe 2000). The abundance of this species varies according to habitat and season, in particular the abundance of grasshoppers. Habitat loss has led to a decline in this species in the south-west of Western Australia (Johnstone and Storr 1998). This species is likely to utilise the Alluvial Plain habitat (15.1% of the project area), and to a lesser extent the Stony Plain habitat (22.9% of the project area). Three Australian Bustards were recorded during the survey overflying the project area (Appendix P and Figure 11).

##### **Rainbow Bee-eater (*Merops ornatus*)**

The Rainbow Bee-eater is a common breeding migrant that occurs in Western Australia in the Kimberley, and Pilbara through to the South-west (Johnstone and Storr 1998). It occurs in lightly wooded, often sandy country, preferring areas near water. The Rainbow Bee-eater feeds on airborne insects, and nests in burrows excavated in sandy ground or banks, often at the margins of roads and tracks (Johnstone and Storr 1998). This species is found throughout most habitat types; however it has a preference for the Minor Drainage Line habitat (6.8%) within the project area. The Rainbow Bee-eater was recorded during the survey (Appendix P and Figure 11) in the Riverine habitat.

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

The Western Pebble-mound Mouse is endemic to the Pilbara, and is confined to the central and eastern Pilbara, including Karijini National Park (Menkhorst and Knight 2004).

The construction of extensive pebble mounds, built from small stones, which typically cover areas from 0.5-9.0 square metres, is characteristic of this species (van Dyck and Strahan 2008). Mounds are restricted to suitable-class stones (0.05 to 10 grams), and are usually found on rocky slopes and spurs (van Dyck and Strahan 2008). This species utilises the Stony Plain habitat (22.9%) and Hillslope habitat (48.8%).

One pebble mound was recorded in the project area during the 2010 survey, this mound was considered to be active when comparing external structure to the index created by Anstee (1996). A list of the pebble-mound locations can be found in Appendix Q along with photographs of the active pebble-mounds. The locations of the pebble-mounds are also presented in Figure 11.

## 5 SUMMARY OF SURVEY FINDINGS

The survey of the Ophthalmia project area recorded the following:

- No species listed under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, or gazetted as Declared Rare Flora under the *Wildlife Conservation Act 1950 (WA)*;
- Four Priority Flora, these being *Acacia subtiliformis* (Priority 3), *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3), and *Indigofera gilesii* subsp. *gilesii* (Priority 3);
- Two introduced species, neither of which are listed as Declared Plants under the *Agriculture and Related Resources Protection Act 1976 (WA)*;
- No vegetation associations representing TECs under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, ESAs under the *Environmental Protection Act 1986 (WA)*, or PECs as listed by the DEC were recorded;
- The Table Land land system has a restricted distribution of 77 km<sup>2</sup> and 0.04%. This land system supports the vegetation association *Triodia* Hummock Grassland 1d with approximately 0.3 km<sup>2</sup> in the project area. As this unit is restricted in distribution it may be affected by the proposed development;
- Seven fauna habitats were recorded in the project area; one habitat type was deemed as having high habitat value;
- Three conservation significant species were recorded during the survey; Australian Bustard (Priority 4), Rainbow Bee-eater (Migratory) and Western Pebble-mound Mouse (Priority 4);
- Ten of the sixteen conservation significant fauna potentially occurring in the project area were deemed as 'Possible' inhabitants; and
- Ground-dwelling fauna such as the Western Pebble-mound Mouse are more likely to be effected by disturbance to their habitat due to their poor dispersal abilities.

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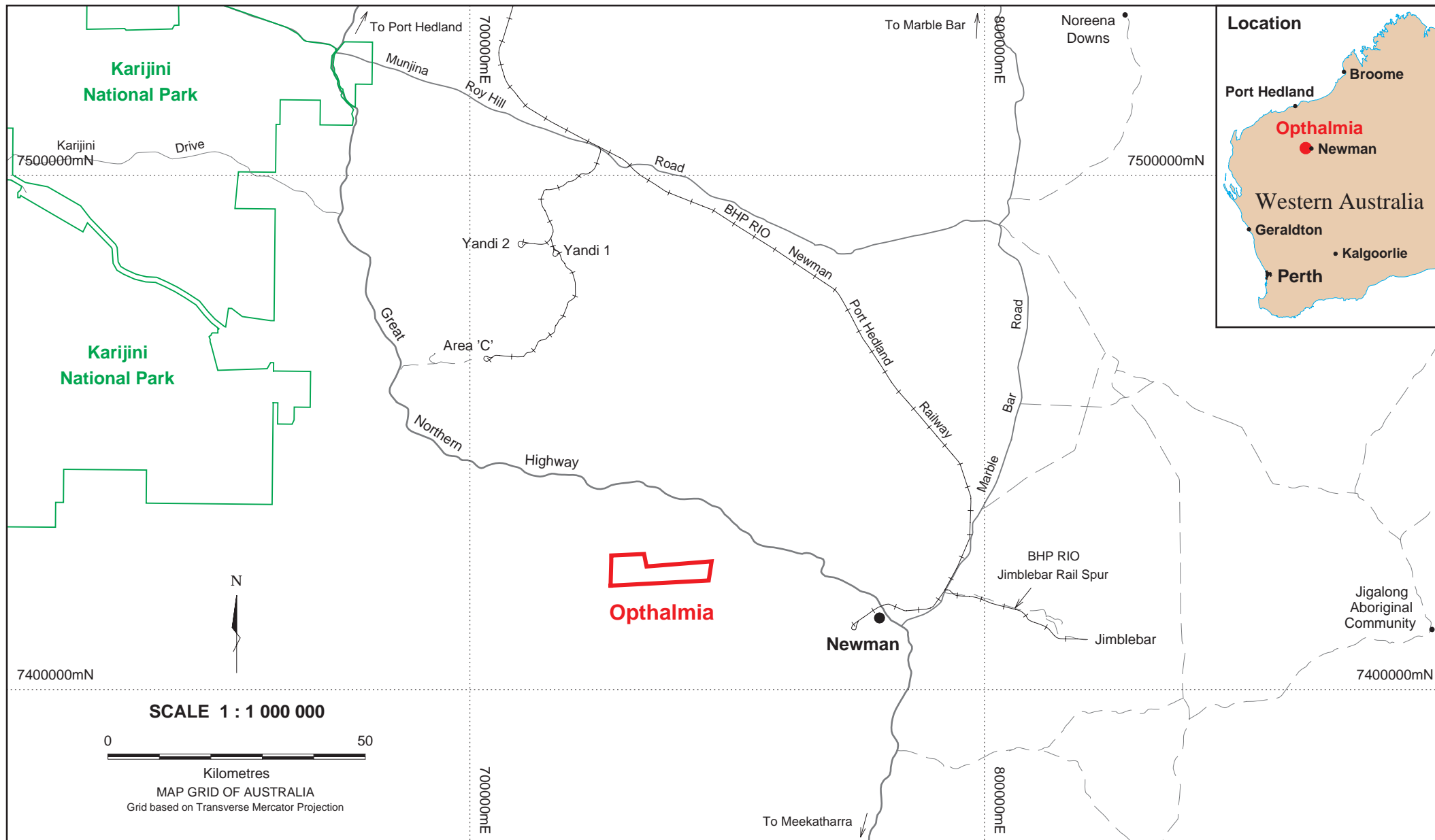
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# FIGURES



Author: E.Carroll  
 Drawn: S.Coleman  
 Status:  
 Job Number: 10.066

Client: **BHP BILLITON IRON ORE**  
 Project: **OPHTHALMIA  
 FLORA, VEGETATION  
 AND FAUNA ASSESSMENT**

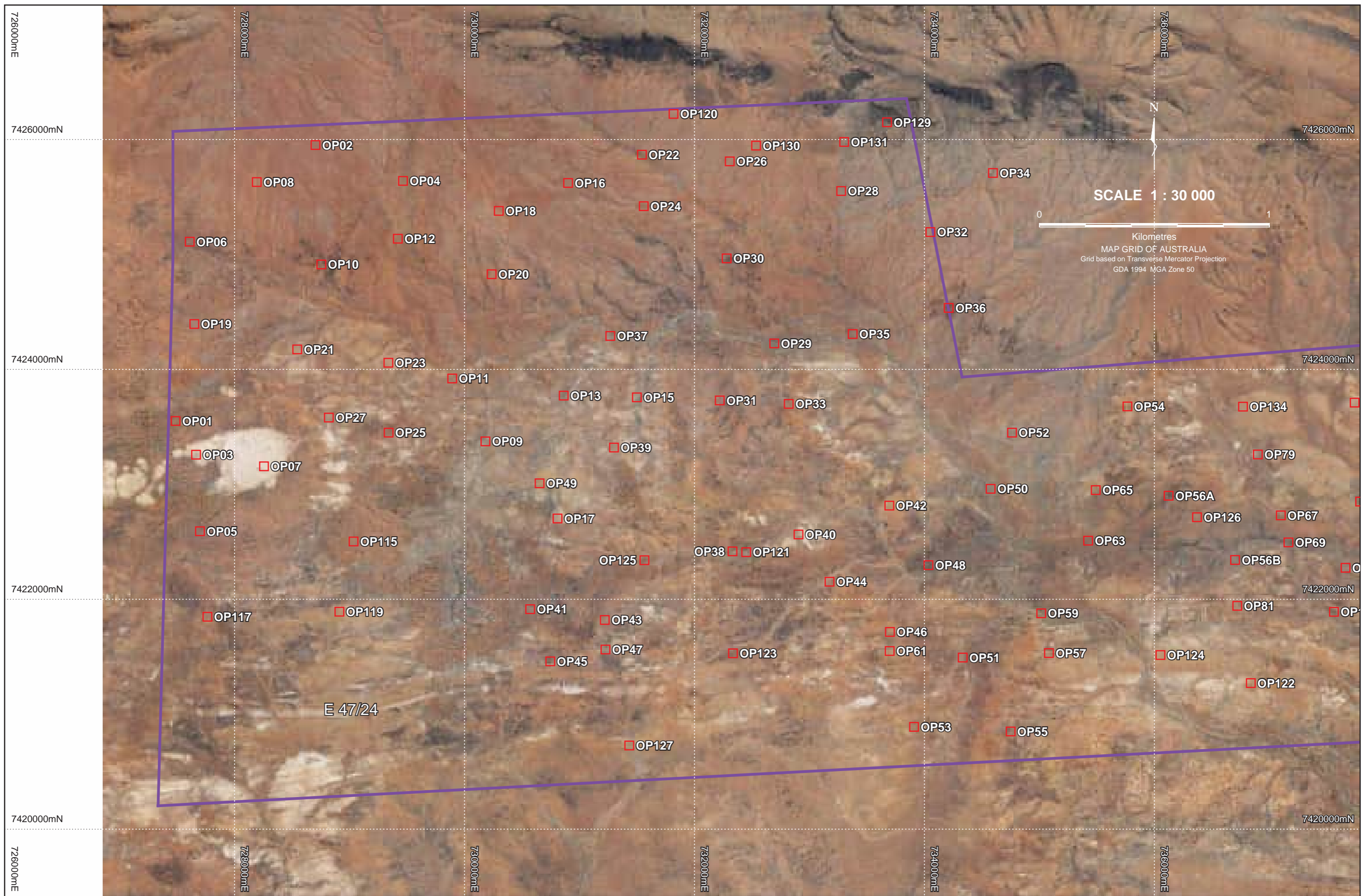
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Date: 23 July 2010

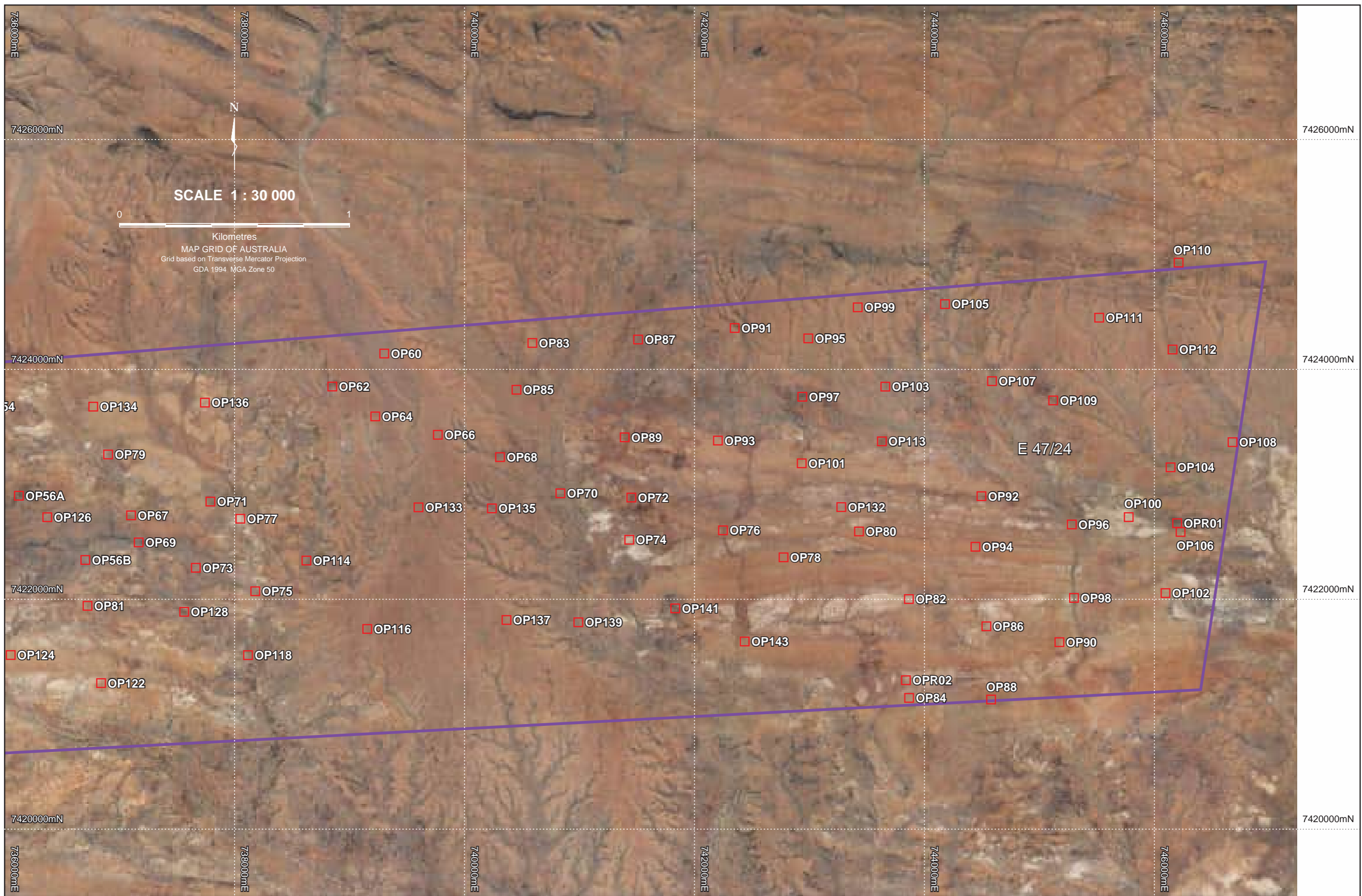
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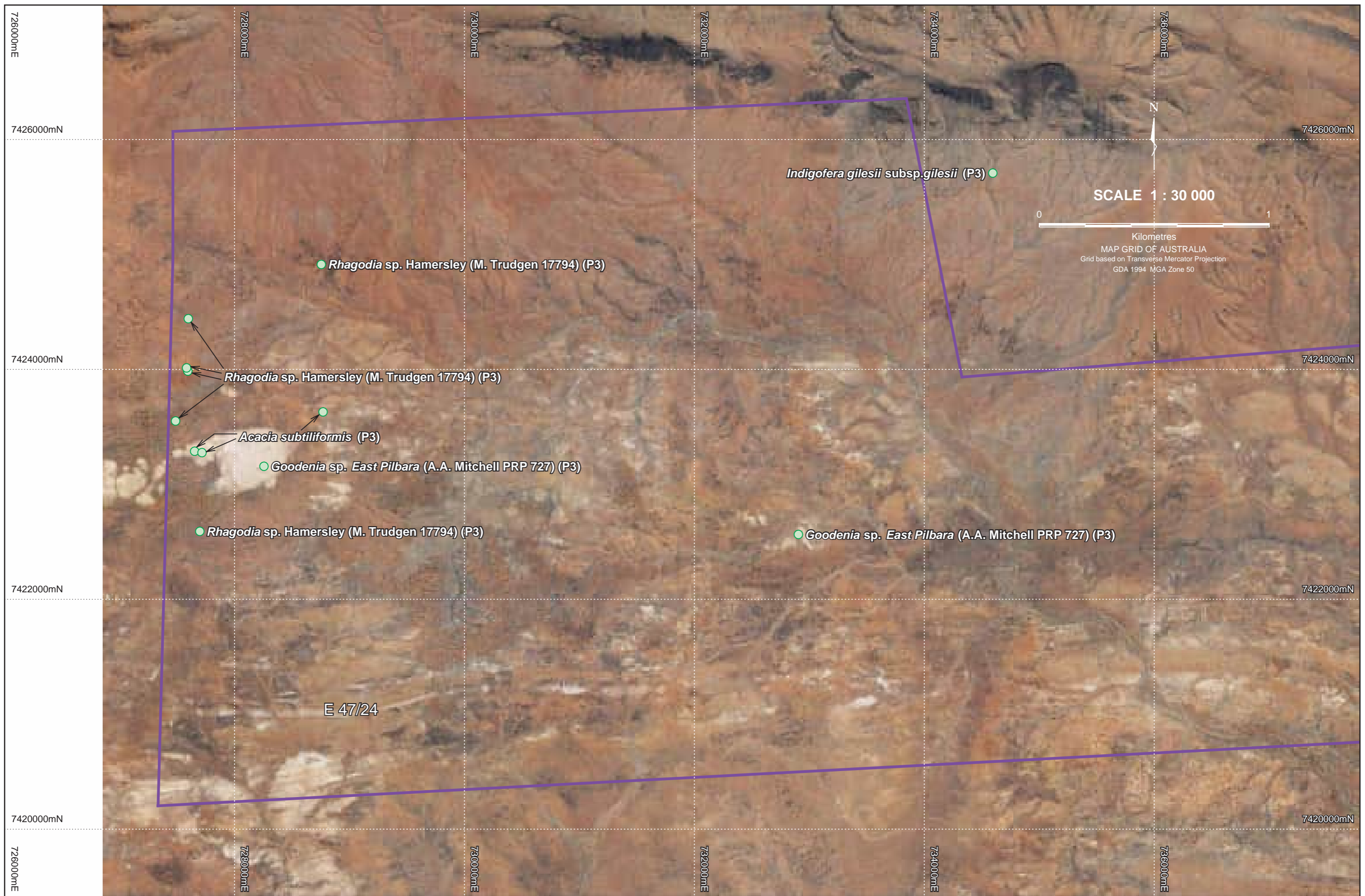
A4 Plan No. **OP-001**



<b>Legend</b> OP20 Flora Quadrats and Relevés	 <b>Location</b>	 Australia	Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>FLORA SURVEY QUADRAT AND RELEVÉ LOCATIONS</b>	Date: 23 July 2010
			Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: 1:30 000
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			Job Number: 10.066			Plan No. <b>OP-010</b>



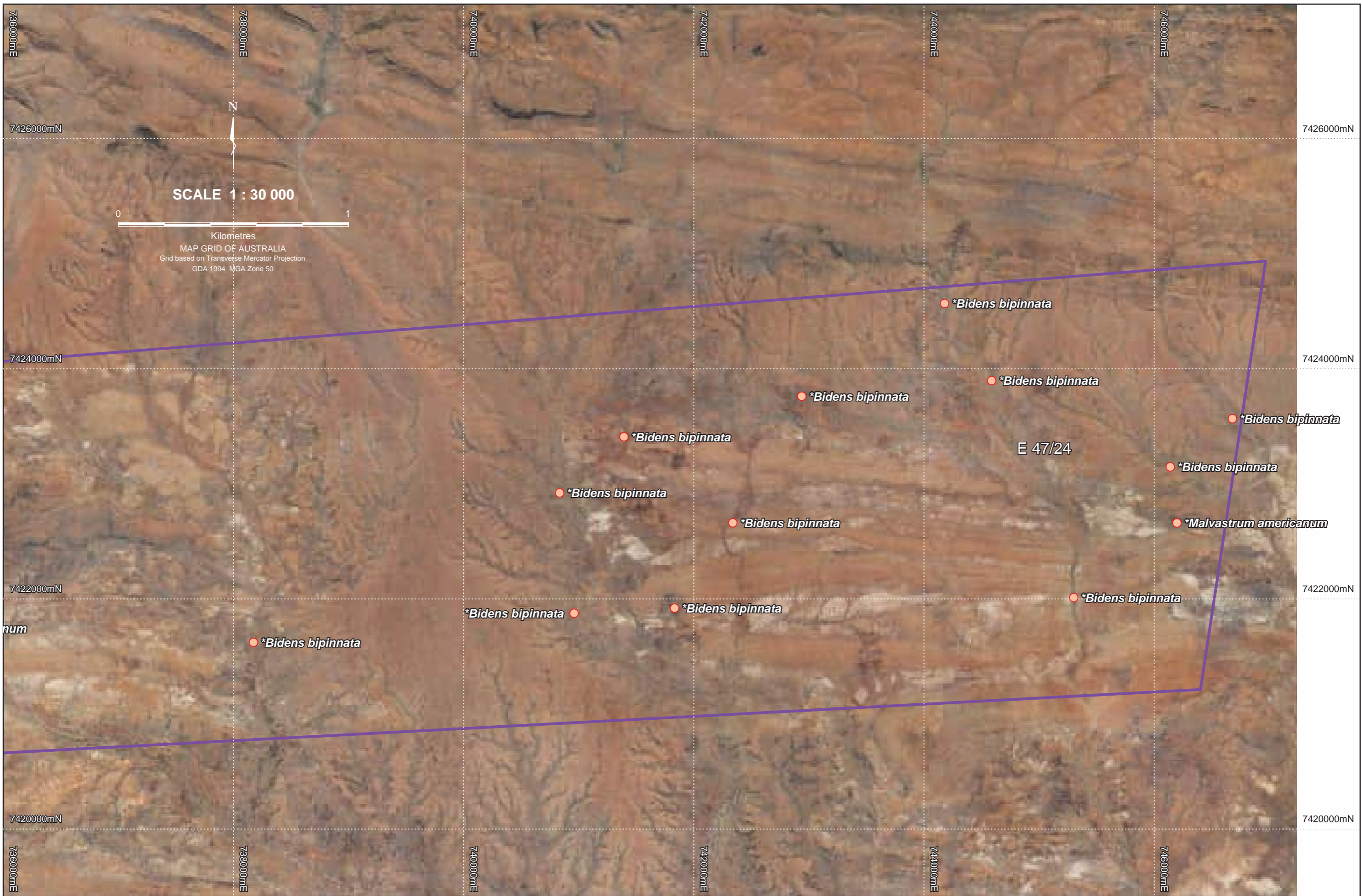
<b>Legend</b> OP20 Flora Quadrats and Relevés	 <b>Location</b>	 Australia	Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>FLORA SURVEY QUADRAT AND RELEVÉ LOCATIONS</b>	Date: 23 July 2010
			Drawn: S.Coleman	Project:		Scale: 1:30 000
			Status:	<b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Figure No. <b>3b</b>
			Job Number: 10.066			Plan No. <b>OP-011</b>



<b>Legend</b> Priority Flora Location	Location		Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>LOCATION OF PRIORITY FLORA</b>	Date: 26 July 2010
			Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: 1:30 000
			Status:			Figure No. <b>4</b>
			Job Number: 10.066			Plan No. <b>OP-016</b>







**Legend**

- Introduced Flora Locations

**Location**

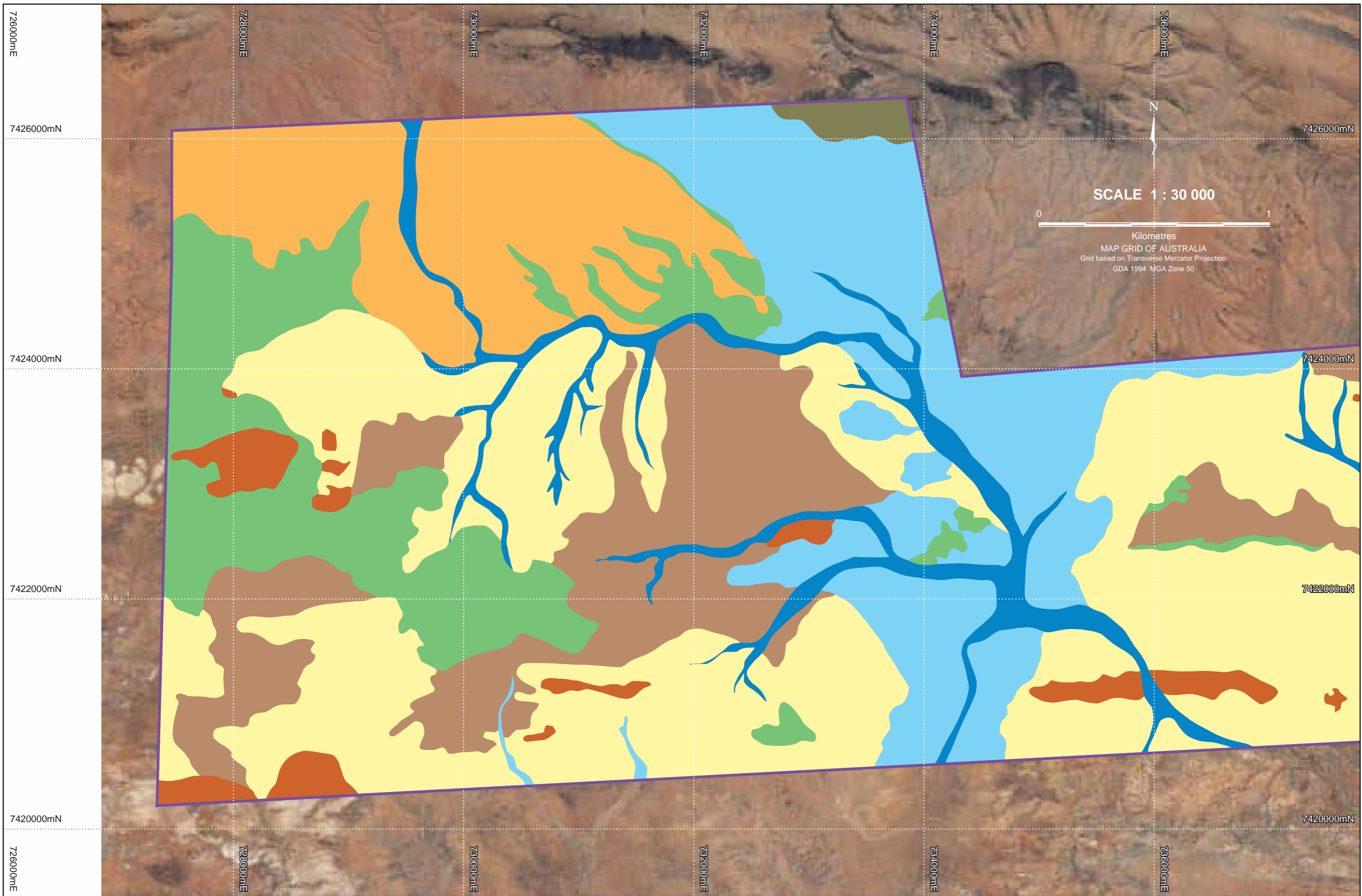
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 Drawn: S.Coleman  
 Status:  
 Job Number: 10.066

Client: **BHP BILLITON IRON ORE**


Project: **OPHTHALMIA  
 FLORA, VEGETATION  
 AND FAUNA ASSESSMENT**

**LOCATION OF  
 INTRODUCED SPECIES**

Date: 26 July 2010  
 Scale: 1:30 000  
 Figure No. **5b**  
 Plan No. **OP-019**



Vegetation Legend - see Figure 6c.


	Author: E.Carroll
	Drawn: S.Coleman
	Status:
	Job Number: 10.066

Client:	<b>BHP BILLITON IRON ORE</b>
Project:	<b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>

**VEGETATION ASSOCIATIONS**

Date:	28 July 2010
Scale:	1:30 000
Figure No.	<b>6a</b>
Plan No.	<b>OP-012</b>



Vegetation Legend - see Figure 6c.		Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>VEGETATION ASSOCIATIONS</b>	Date: 28 July 2010
		Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: 1:30 000
		Status:			Figure No. <b>6b</b>
		Job Number: 10.066			Plan No. <b>OP-013</b>

## Vegetation Legend



Hummock Grassland of *Triodia wiseana*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia ancistrocarpa*, *Acacia bivenosa* and *Acacia inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Corymbia hamersleyana* on Red-Brown Loam with a covering of cobbles and pebbles on low hills.



Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *Eucalyptus socialis* subsp. *eucentrica* and *Eucalyptus repullulans* on Red-Brown Loam on Low Hill.



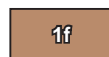
Hummock Grassland of *Triodia wiseana*, *Triodia brizoides* and *Triodia pungens* with Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Acacia citrinoviridis* with Low Open Shrubland of *Scaevola browniana* subsp. *browniana*, *Eremophila jucunda* subsp. *pulcherrima* and *Keraudrenia nephrosperma* on Red-Brown Loam on Steep Hill Slopes.



Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-Brown Loam with a covering of cobbles and pebbles on Low undulating hills.



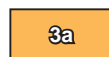
Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulate* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.



Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *Triodia wiseana* with Tall Shrubland of *Acacia catenulate* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-Brown Loam with a covering of cobbles and pebbles on Sloping Hills and Drainage Gullies.

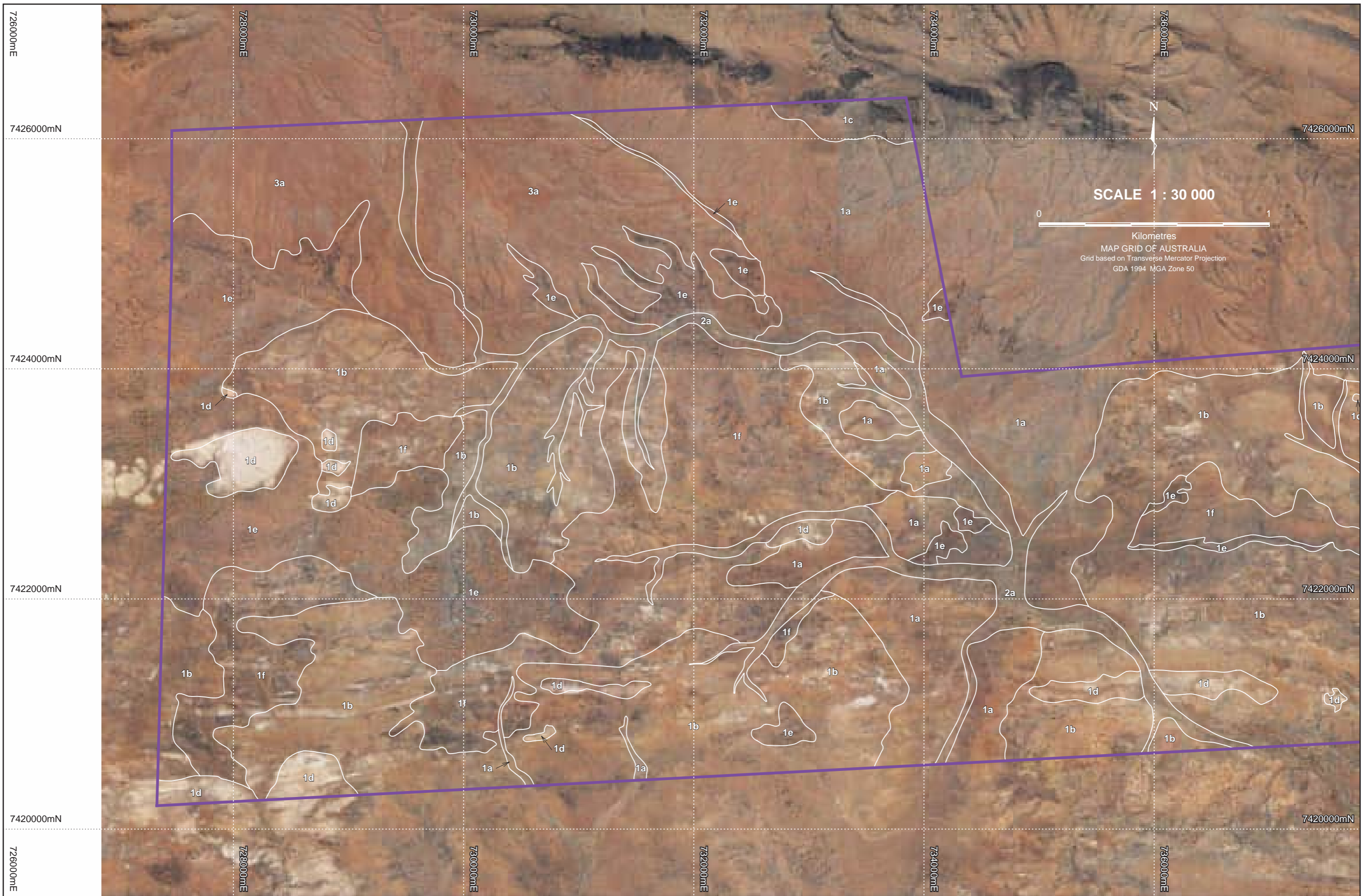



Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *Eucalyptus victrix* on Red-Brown Clayey Loam in Drainage Lines.

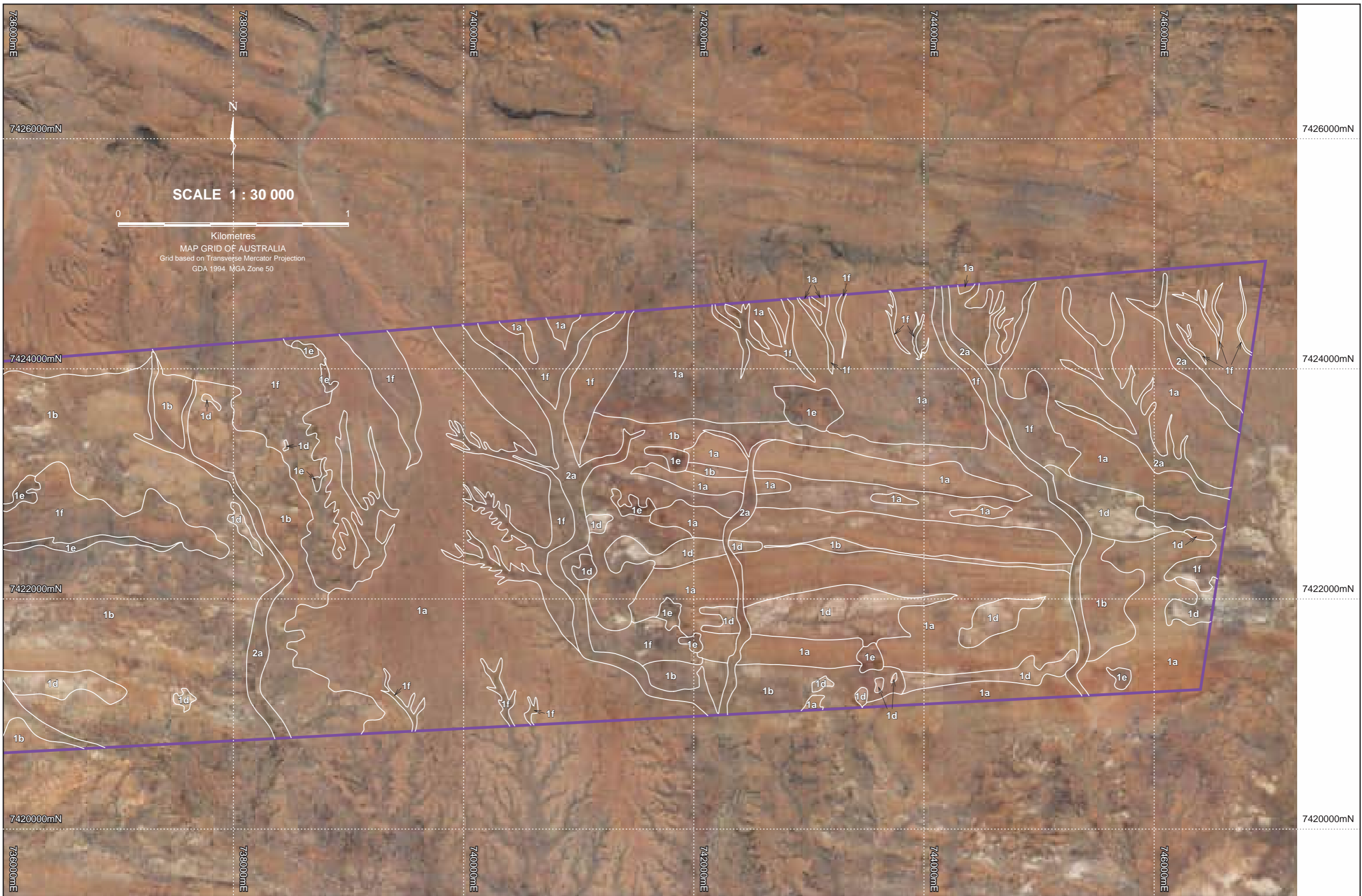



Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-Brown Loam with a covering of cobbles and pebbles on Hill Slopes.

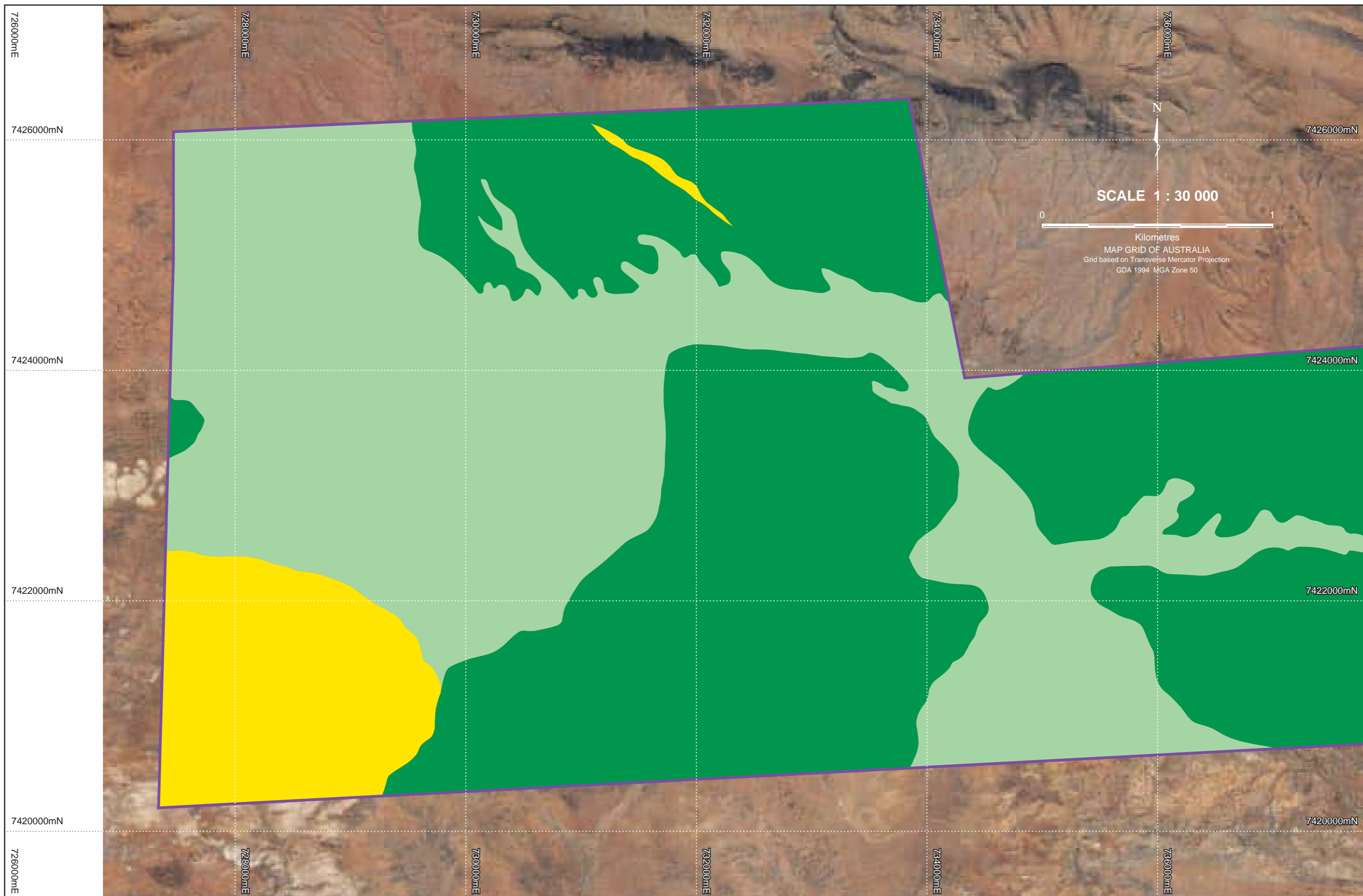
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	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: NTS
			Author: E.C. / S.C.
			Figure No. <b>6c</b>
			Plan No. <b>OP-020</b>
		10.066	A4



Vegetation Legend - see Figure 6c.		Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>VEGETATION ASSOCIATIONS LINEWORK</b>	Date: 28 July 2010
		Drawn: S.Coleman	Project:		Scale: 1:30 000
		Status:	<b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Figure No. <b>7a</b>
		Job Number: 10.066			Plan No. <b>OP-021</b>



Vegetation Legend - see Figure 6c.	 Australia	Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>VEGETATION ASSOCIATIONS LINEWORK</b>	Date: 28 July 2010
		Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: 1:30 000
		Status:			Figure No. <b>6b</b>
		Job Number: 10.066			Plan No. <b>OP-022</b>



<b>Vegetation Condition</b>	Pristine	Very Good
	Excellent	Good

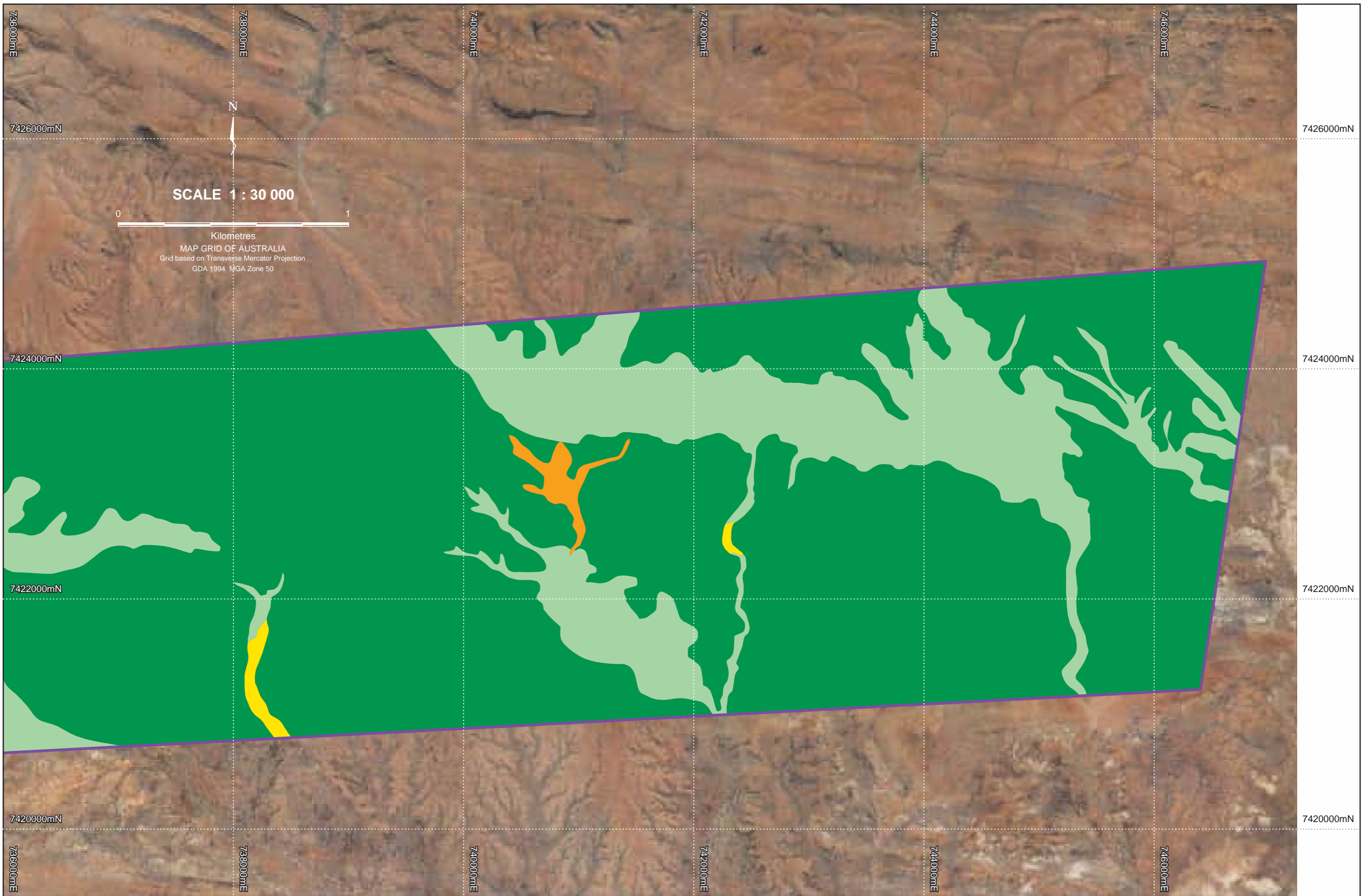
**Location**

Author: E.Carroll
Drawn: S.Coleman
Status:
Job Number: 10.066

Client: <b>BHP BILLITON IRON ORE</b>
Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>

<b>VEGETATION CONDITION</b>
-----------------------------

Date: 23 July 2010
Scale: 1:30 000
Figure No. <b>8a</b>
Plan No. <b>OP-014</b>

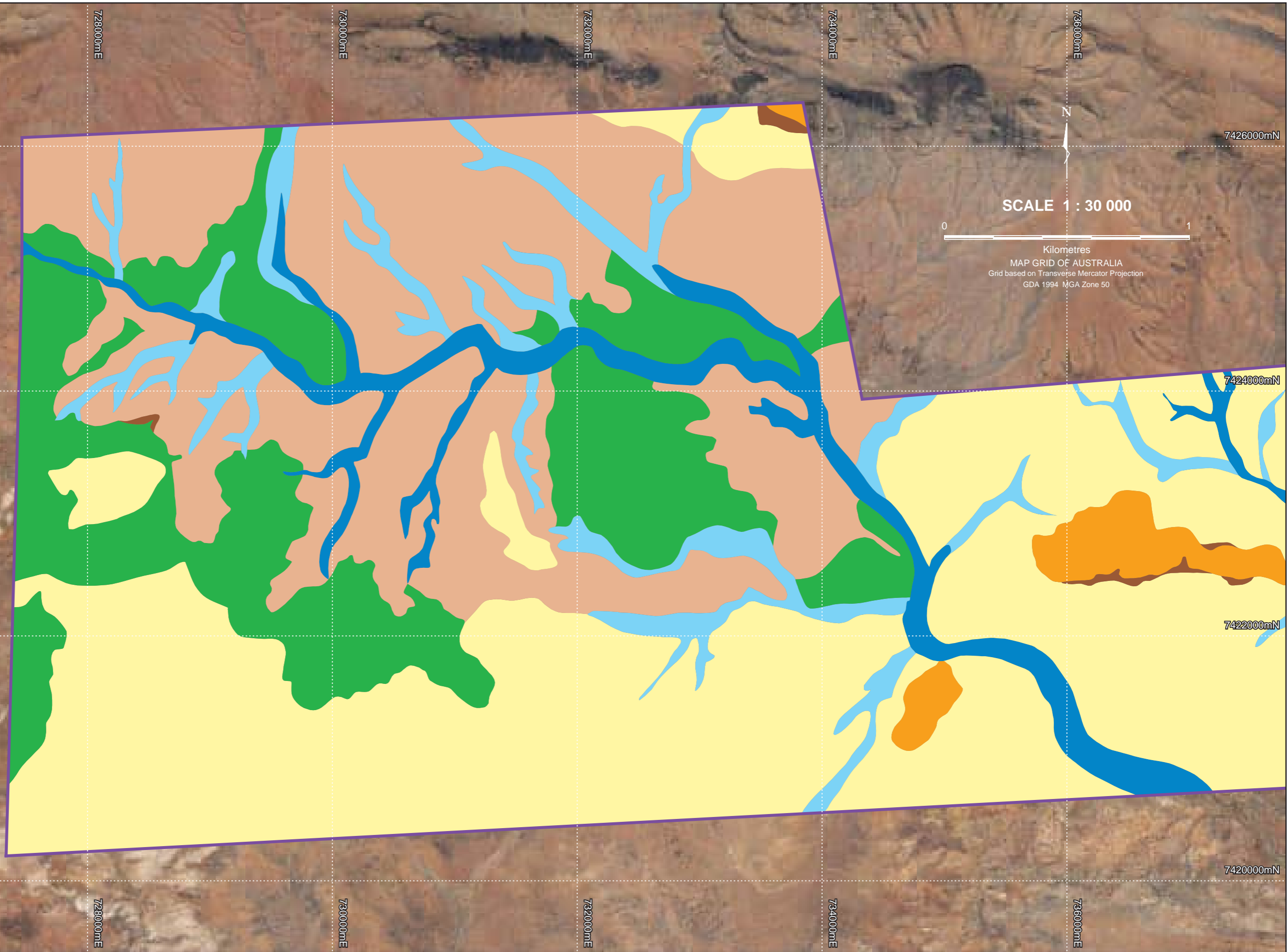


<b>Vegetation Condition</b> 			Author: E.Carroll	Client: <b>BHP BILLITON IRON ORE</b>	<b>VEGETATION CONDITION</b> Date: 23 July 2010 Scale: 1:30 000 Figure No. <b>8b</b> Plan No. <b>OP-015</b>
			Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>	
			Status:		
			Job Number: 10.066		



**Fauna Habitat**

- Riverine
- Minor Drainage
- Alluvial Plain
- Stoney Plain
- Hill Crest
- Hill Slope
- Breakaway



N

**SCALE 1 : 30 000**

0 ————— 1

Kilometres

MAP GRID OF AUSTRALIA  
Grid based on Transverse Mercator Projection  
GDA 1994 MGA Zone 50

7424000mN

7422000mN

7420000mN

726000mE

728000mE

730000mE

732000mE

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736000mE

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7424000mN

7422000mN

7420000mN

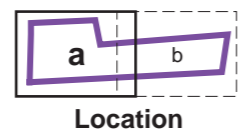
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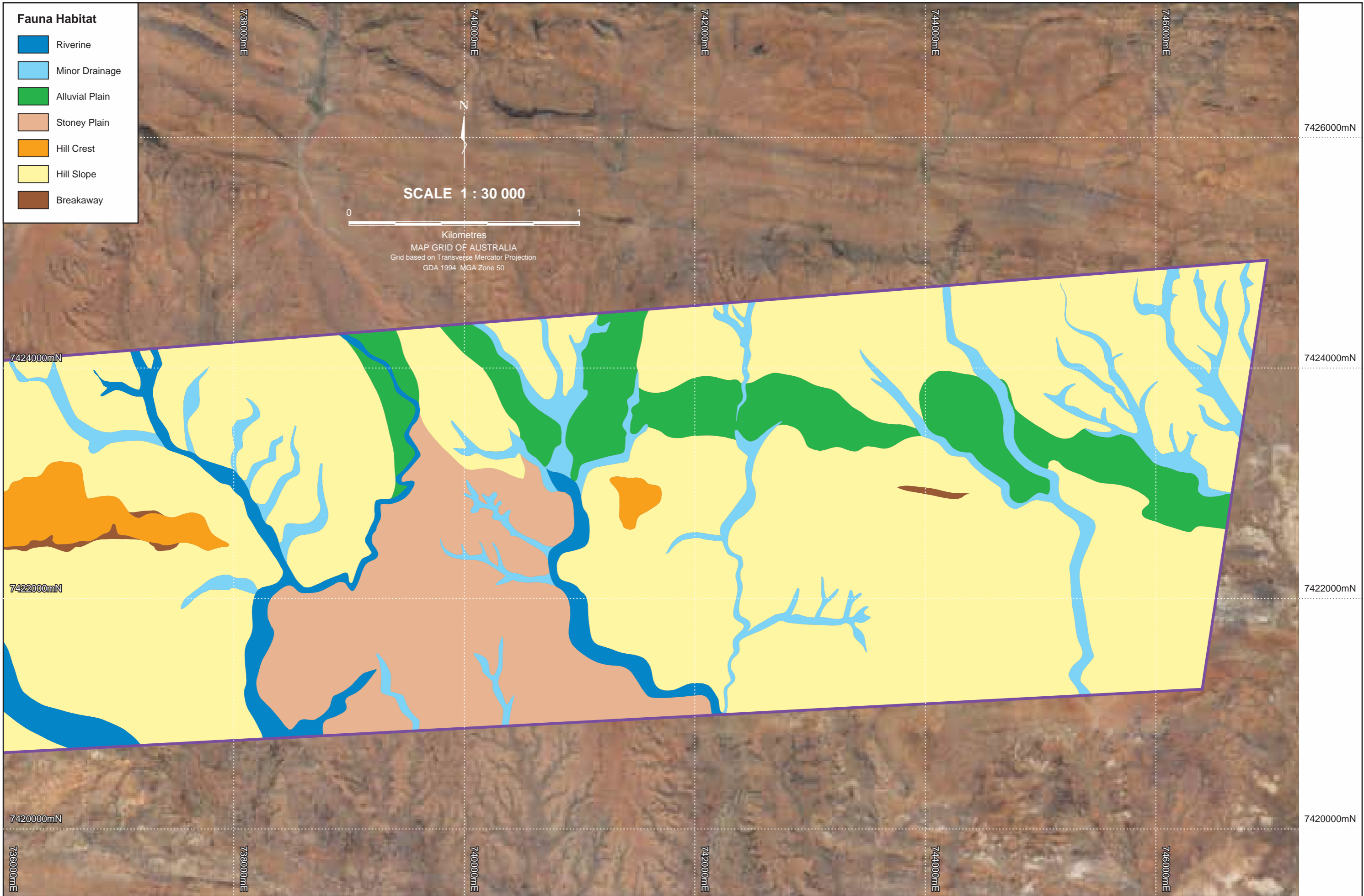
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 Job Number: 10.066

Client: **BHP BILLITON IRON ORE**  
 Project: **OPHTHALMIA  
 FLORA, VEGETATION  
 AND FAUNA ASSESSMENT**

**FAUNA HABITAT**

Date: 26 July 2010  
 Scale: 1:30 000  
 Figure No. **9a**  
 Plan No. **OP-002**

A3




**Fauna Habitat**

- Riverine
- Minor Drainage
- Alluvial Plain
- Stony Plain
- Hill Crest
- Hill Slope
- Breakaway

SCALE 1 : 30 000  
 0 ————— 1  
 Kilometres  
 MAP GRID OF AUSTRALIA  
 Grid based on Transverse Mercator Projection  
 GDA 1994 MGA Zone 50

a
  b

**Location**



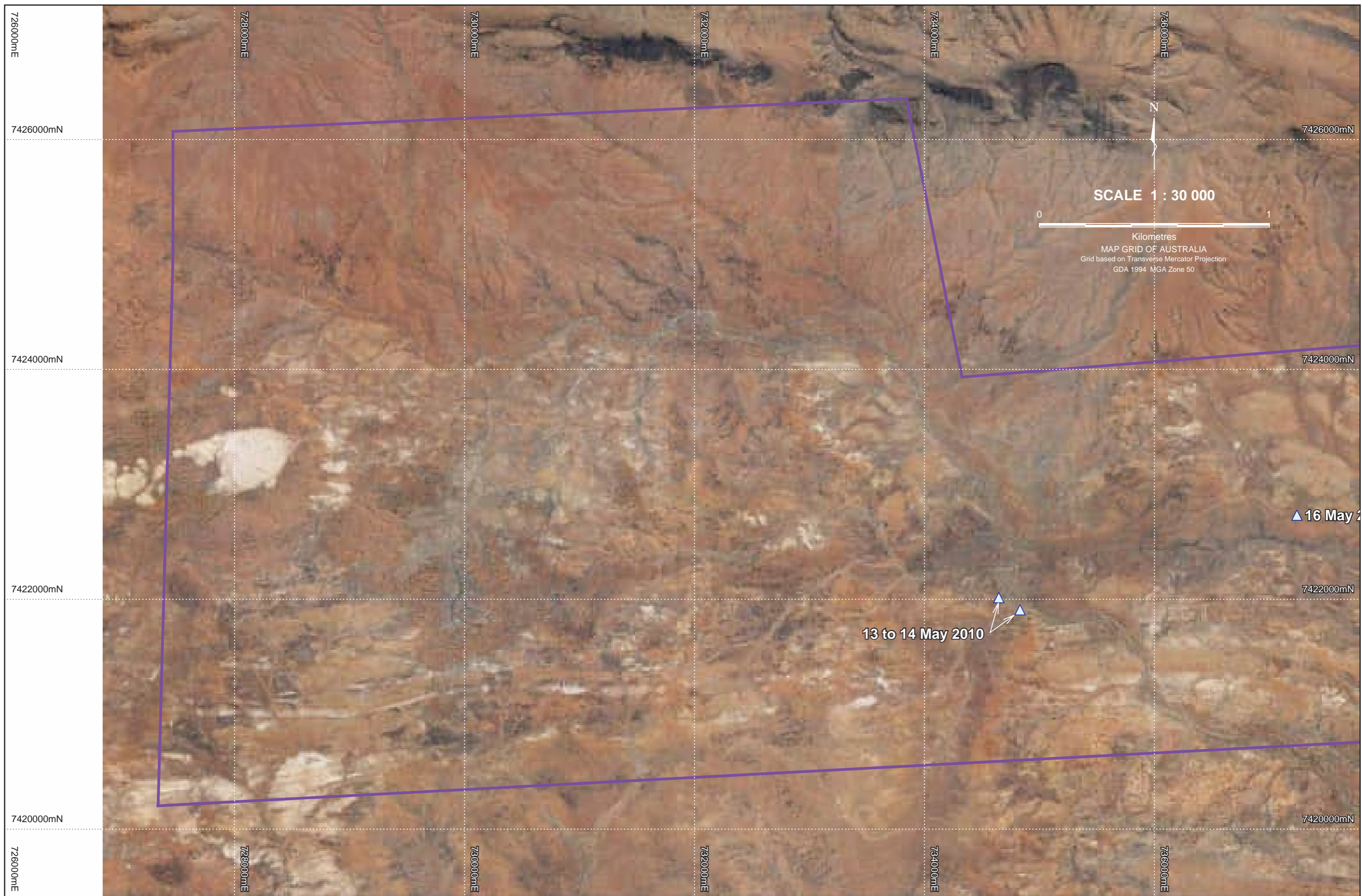
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Author: E.Carroll
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Status:
Job Number: 10.066

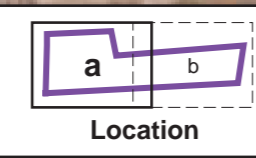
Client: <b>BHP BILLITON IRON ORE</b>
Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>

## FAUNA HABITAT

Date: 26 July 2010
Scale: 1:30 000
Figure No. <b>9b</b>
Plan No. <b>OP-003</b>



**Legend**  
 ▲ Bat Recording Location

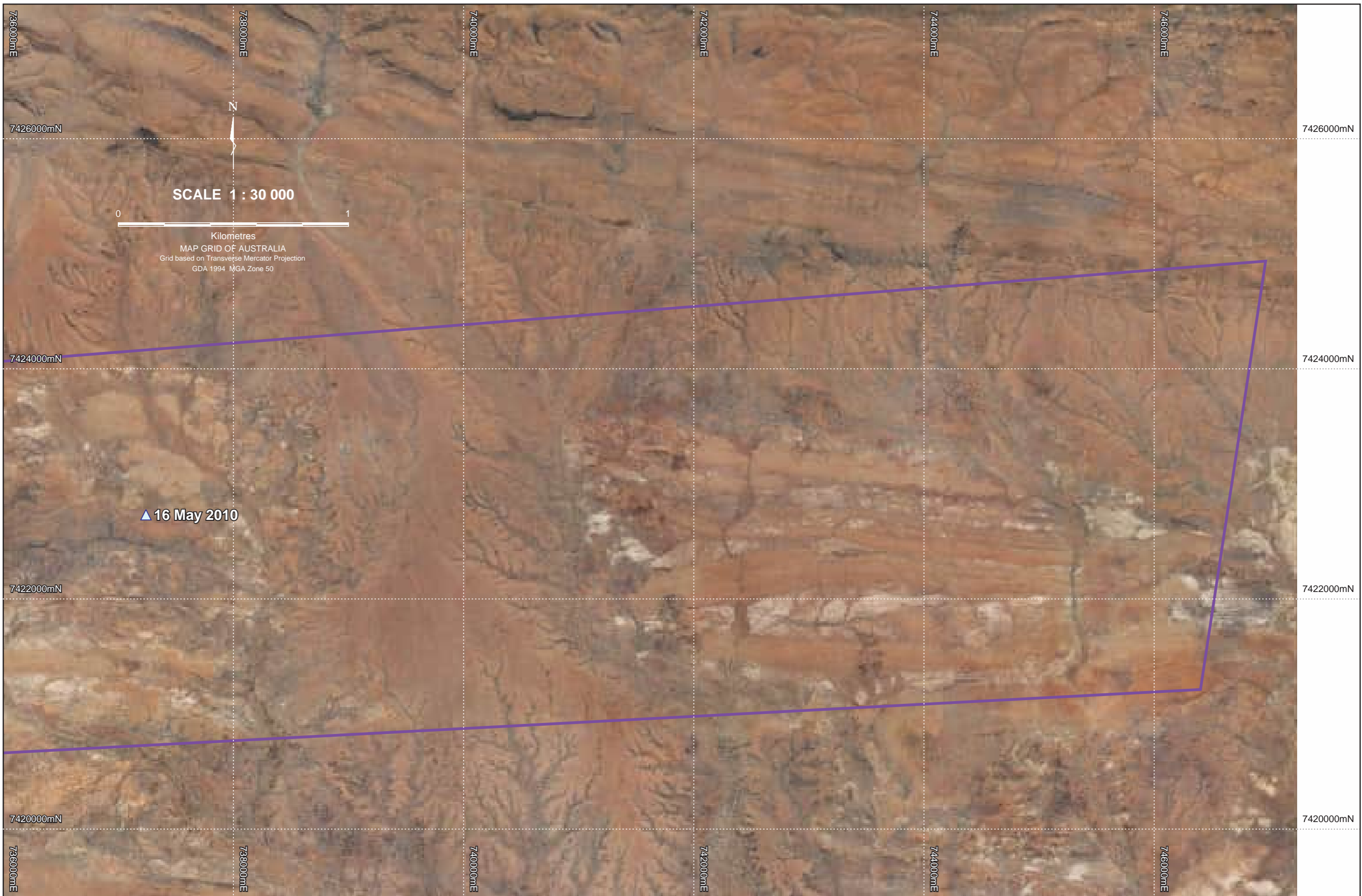


Author: M.Brown  
 Drawn: S.Coleman  
 Status:  
 Job Number: 10.066

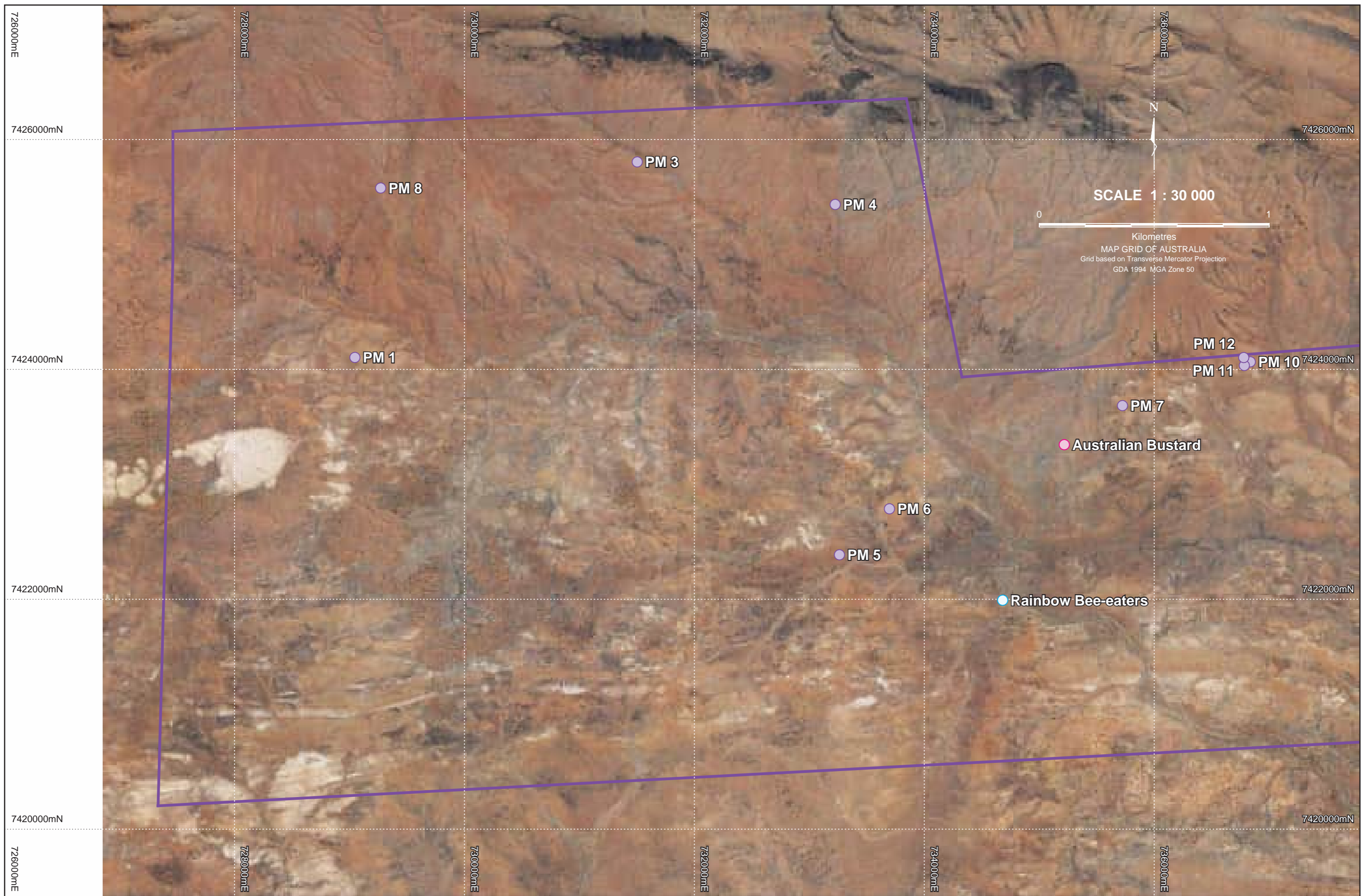
Client: **BHP BILLITON IRON ORE**  
 Project: **OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT**

**BAT RECORDING LOCATIONS**

Date: 26 July 2010  
 Scale: 1:30 000  
 Figure No. **10a**  
 Plan No. **OP-004**




<b>Legend</b> Bat Recording Location	 <b>Location</b>	 Australia	Author: M.Brown	Client: <b>BHP BILLITON IRON ORE</b>	<b>BAT RECORDING LOCATIONS</b>	Date: 26 July 2010
			Drawn: S.Coleman	Project: <b>OPHTHALMIA FLORA, VEGETATION AND FAUNA ASSESSMENT</b>		Scale: 1:30 000
			Status:			Figure No. <b>10b</b>
			Job Number: 10.066			Plan No. <b>OP-005</b>



**Legend**

- Pebble Mound
- Australian Bustard
- Rainbow Bee-eaters

**Location**



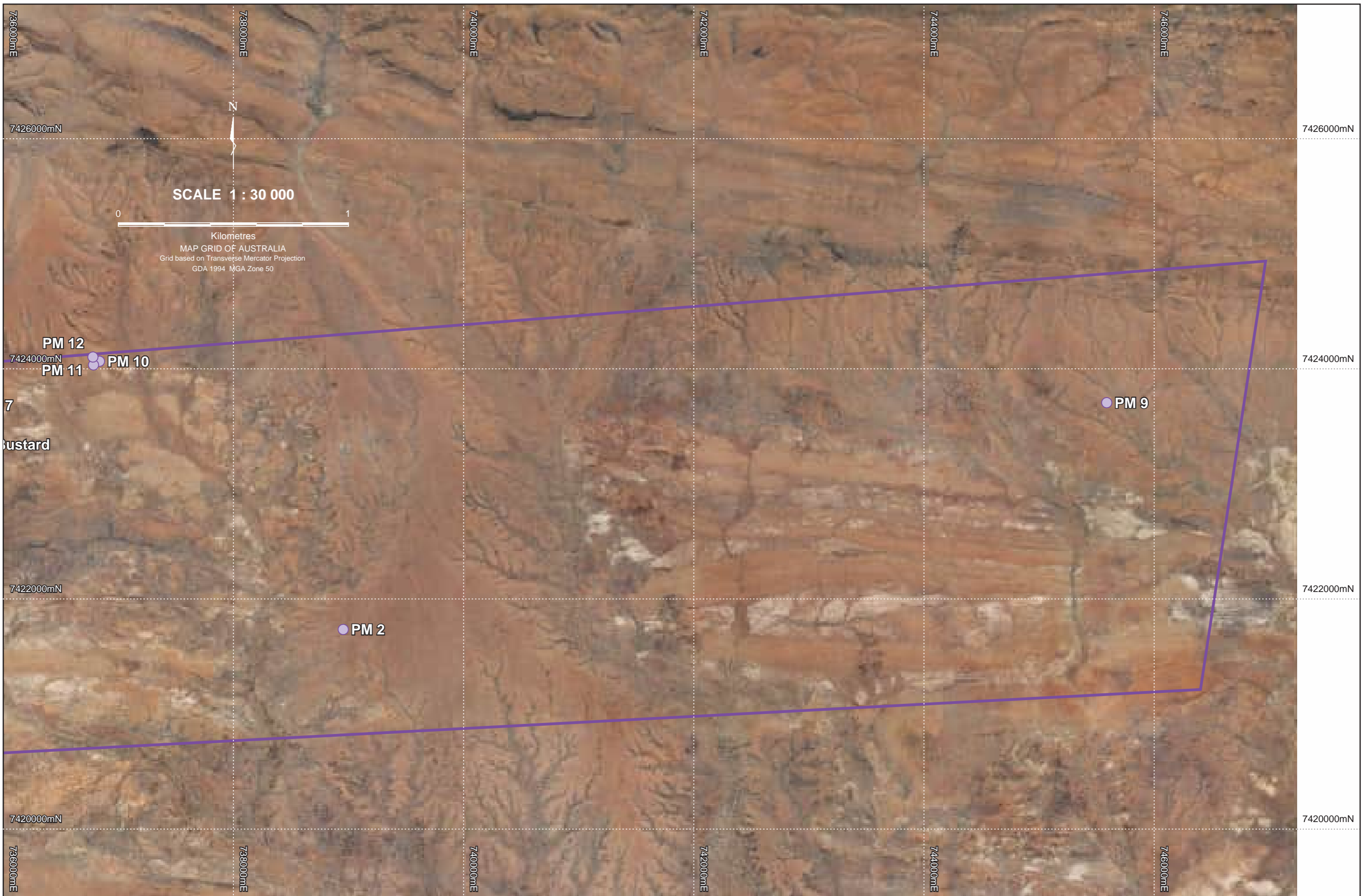
Author: M.Brown  
 Drawn: S.Coleman  
 Status:  
 Job Number: 10.066

Client: **BHP BILLITON IRON ORE**

Project: **OPHTHALMIA  
 FLORA, VEGETATION  
 AND FAUNA ASSESSMENT**

**CONSERVATION SIGNIFICANT  
 FAUNA LOCATIONS**

Date: 26 July 2010  
 Scale: 1:30 000  
 Figure No. **11a**  
 Plan No. **OP-006**




**Legend**

- Pebble Mound
- Australian Bustard
- Rainbow Bee-eaters

a
b

**Location**



Author: M.Brown  
 Drawn: S.Coleman  
 Status:  
 Job Number: 10.066

Client: **BHP BILLITON IRON ORE**

Project: **OPHTHALMIA  
 FLORA, VEGETATION  
 AND FAUNA ASSESSMENT**

**CONSERVATION SIGNIFICANT  
 FAUNA LOCATIONS**

Date: 26 July 2010  
 Scale: 1:30 000  
 Figure No. **11b**  
 Plan No. **OP-007**

**APPENDIX A**

**DEFINITION OF DECLARED RARE /  
PRIORITY / THREATENED FLORA AND  
SIGNIFICANT FLORA POTENTIALLY  
OCCURRING IN THE  
PROJECT AREA**

## APPENDIX A

## DEFINITION OF DECLARED RARE / PRIORITY / THREATENED FLORA AND SIGNIFICANT FLORA POTENTIALLY OCCURRING IN THE PROJECT AREA

## A1: Categories of Declared Rare and Priority Flora

Conservation Code	Category
X	<p><b>Declared Rare Flora - Presumed Extinct Taxa</b></p> <p>Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.</p>
R	<p><b>Declared Rare Flora - Extant Taxa</b></p> <p>“Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such”</p>
P1	<p><b>Priority One - Poorly Known Taxa</b></p> <p>“Taxa which are known from one or a few (generally &lt;5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as ‘rare flora’, but urgently need further survey.”</p>
P2	<p><b>Priority Two - Poorly Known Taxa</b></p> <p>“Taxa which are known from one or a few (generally &lt;5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’, but urgently need further survey.”</p>
P3	<p><b>Priority Three - Poorly Known Taxa</b></p> <p>“Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as ‘rare flora’ but need further survey.”</p>
P4	<p><b>Priority Four - Rare Taxa</b></p> <p>“Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.”</p>

Source: Department of Environment and Conservation (2010). *Western Australian Flora Conservation Codes*. Department of Environment and Conservation, Perth, Western Australia. Online: <http://florabase.calm.wa.gov.au>.



## A2: Categories of Threatened Flora Species

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

Source: Environment Protection and Biodiversity Conservation Act 1999

**A3: Significant Flora Species Potentially Occurring in the Project Area**

Species	Code	Description (WAH 2010)
<i>Lepidium catapycnon</i>	DRF & Vulnerable	Woody perennial herb or shrub to 0.3 m high. Found on skeletal soils on hillsides.
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	P1	Compactly tufted perennial, grass-like or herb to 0.3–0.8 m high. Found on hardpan plains.
<i>Brachyscome</i> sp. Wanna Munna Flats (S. van Leeuwen 4662)	P1	Description unavailable.
<i>Brunonia</i> sp. Long hairs (D.E. Symon 2440)	P1	Erect herb, to 0.07 m high, with long spreading hairs on the leaves; spike to 0.3 m high. Found along creeklines.
<i>Eragrostis</i> sp. Mt Robinson (S. van Leeuwen 4109)	P1	Tussock-forming perennial, grass-like or herb to 0.3 m high. Found on red-brown skeletal soils (ironstone) on steep slopes and summits.
<i>Eremophila</i> sp. West Angelas (S. van Leeuwen 4068)	P1	Description unavailable.
<i>Goodenia</i> sp. East Pilbara (AA Mitchell PRP 727)	P1	Open, erect annual or biennial herb to 0.2 m high. Found on clay soil, calcrete pebbles, low undulating plain, or swampy plains.
<i>Aristida lazaridis</i>	P2	Tufted perennial, grass-like or herb to 0.4–1.5 m high with green, purple flowers. Found on sand or loam.
<i>Isotropis parviflora</i>	P2	Shrub to 0.1 m high with white, pink flowers. Found on valley slopes of ironstone plateaus.
<i>Oxalis</i> sp. Pilbara (M.E. Trudgen 12725)	P2	Description unavailable.
<i>Pilbara trudgenii</i>	P2	Gnarled, aromatic shrub to 1 m high. Found on skeletal, red stony soil over ironstone on hill summits, steep slopes, screes and cliff faces.
<i>Stylidium weeliwollii</i>	P2	Annual, herb, 0.1–0.25 m high with pink, red flowers. Found on gritty sand soil and sandy clay on the edge of watercourses.
<i>Acacia bromilowiana</i>	P3	Tree or shrub to 12 m high. Fl. yellow, pink, Jul–Aug. Found on a range of soils such as, red skeletal stony loam, orange-brown pebbly, gravel loam, laterite, banded ironstone and basalt, and on a range of landforms, such as rocky hills, breakaways, scree slopes, gorges and creek beds.
<i>Acacia subtiliformis</i>	P3	Spindly, slender, erect shrub to 3.5 m high. Fl. yellow, Jun. Found on rocky calcrete plateaus.
<i>Amaranthus centralis</i>	P3	Description unavailable.

Species	Code	Description (WAH 2010)
<i>Dampiera metallorum</i>	P3	Rounded, multistemmed perennial, herb to 0.5 m high with blue flowers. Found on skeletal red-brown gravelly soil over banded ironstone on steep slopes and summits of hills.
<i>Eremophila magnifica</i> subsp. <i>velutina</i>	P3	Shrub to 0.5-1.5 m high with blue, purple flowers. Found on skeletal soils over ironstone on summits.
<i>Eremophila rigida</i>	P3	Bushy shrub to 0.3–4 m high with cream flowers. Found on red sand alluvium on hardpan plains and stony clay depressions.
<i>Fimbristylis sieberiana</i>	P3	Shortly rhizomatous, tufted perennial, grass-like or herb (sedge) to 0.25–0.6 m high with brown flowers. Found in mud, skeletal soil pockets on pool edges and sandstone cliffs.
<i>Frankenia georgei</i>	P3	Small shrub with pink flowers. Found on rocky slopes.
<i>Indigofera gilesii</i> subsp. <i>gilesii</i>	P3	Shrub to 1.5 m high with purple, pink flowers. Found on pebbly loam amongst boulders and outcrops and hills.
<i>Maireana prosthecochoaeta</i>	P3	Open, densely-leaved shrub to 0.3–0.6 m high. Found on laterite on hills and salty places.
<i>Nicotiana umbratica</i>	P3	Erect, short-lived annual or perennial, herb to 0.3–0.7 m high with white flowers. Found on shallow soils and rocky outcrops.
<i>Rhagodia</i> sp. Hamersley (ME Trudgen 17794)	P3	Description unavailable.
<i>Tephrosia bidwillii</i>	P3	Shrub to 0.3–0.9 m high with orange flowers.
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	P3	Tussocky perennial, grass-like or herb to 0.9-1.8 m high. Fl. Aug. Found on red clay on clay pans and grass plains.
<i>Xanthoparmelia nashii</i>	P3	Description unavailable.
<i>Eremophila magnifica</i> subsp. <i>magnifica</i>	P4	Shrub to 0.5-1.5 m high. Fl. blue, Aug–Nov. Found on skeletal soils over ironstone on rocky screes.
<i>Goodenia nuda</i>	P4	Erect to ascending herb to 0.5 m high with yellow flowers.

Source: Department of Environment and Conservation Database Search (April 2010)

**APPENDIX B**  
**DEFINITIONS OF CONSERVATION CODES**  
**FOR FAUNA OF CONSERVATION**  
**SIGNIFICANCE**

## APPENDIX B

### DEFINITIONS OF CONSERVATION CODES FOR FAUNA OF CONSERVATION SIGNIFICANCE

#### **B1: *Environment Protection and Biodiversity Conservation Act 1999 (Cth): Threatened Species and Threatened Ecological Communities Codes***

The *EPBC Act* prescribes seven matters of national environmental significance:-

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance;
- Threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas; and
- Nuclear actions (including uranium mining).

Species in the categories ExW, CE, E, V and M (see below), and Threatened Ecological Communities in the CE and E categories are protected as matters of national environmental significance under the *EPBC Act*.

Category	Code	Category
<b>Extinct</b>	<b>Ex</b>	Taxa for which there is no reasonable doubt that the last member of the species has died.
<b>Extinct in the Wild</b>	<b>ExW</b>	Taxa known to survive only in cultivation, in captivity or as a naturalised population well outside its past range; or not recorded in its known and/or expected habitat at appropriate seasons anywhere in its past range despite exhaustive surveys over a timeframe appropriate to its life cycle and form.
<b>Critically Endangered</b>	<b>CE</b>	Taxa facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
<b>Endangered</b>	<b>E</b>	Taxa not critically endangered and facing a very high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
<b>Vulnerable</b>	<b>V</b>	Taxa not critically endangered or endangered and facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
<b>Conservation Dependent</b>	<b>CD</b>	Taxa which are the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within five years.

Category	Code	Category
<b>Migratory</b>	<b>Mi</b>	<p>Taxa that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations, that are included in an international agreement approved by the Minister for the Environment, Heritage and the Arts and that have been placed on the national List of Migratory Species under the provisions of the EPBC Act. At present there are four such agreements:</p> <ul style="list-style-type: none"> <li>• the Bonn Convention</li> <li>• the China-Australia Migratory Bird Agreement (CAMBA)</li> <li>• the Japan-Australia Migratory Bird Agreement (JAMBA)</li> <li>• the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)</li> </ul>
<b>Marine</b>	<b>Ma</b>	<p>Taxa protected in a Commonwealth Marine Protected Area by virtue of section 248 of the <i>EPBC Act</i>. These taxa include certain seals, crocodiles, turtles and birds, as well as various marine fish.</p> <p>Commonwealth marine areas are matters of national environmental significance under the <i>EPBC Act</i>.</p> <p>An action will require approval if the:</p> <ul style="list-style-type: none"> <li>• action is taken in a Commonwealth marine area and the action has, will have, or is likely to have a significant impact on the environment, or</li> <li>• action is taken outside a Commonwealth marine area and the action has, will have, or is likely to have a significant impact on the environment in a Commonwealth marine area<sup>1</sup></li> </ul> <p>The Commonwealth marine area is any part of the sea, including the waters, seabed, and airspace, within Australia's exclusive economic zone and/or over the continental shelf of Australia, that is not State or Northern Territory waters.</p> <p>The Commonwealth marine area stretches from 3 to 200 nautical miles (approximately 5-370 km) from the coast. Marine protected areas are marine areas which are recognised to have high conservation value.</p>

**B2: Western Australian Threatened Fauna Categories*****Wildlife Conservation Act 1950 (WA)***

Category	Code	Description
Schedule 1	S1	Rare or likely to become extinct.
Schedule 2	S2	Presumed extinct.
Schedule 3	S3	Birds subject to an agreement between the governments of Australia and Japan, the People's Republic of China & the Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.
Schedule 4	S4	Other specially protected fauna.

**B3: Department of Environment and Conservation Fauna Priority Codes**

Category	Code	Description
Priority 1	P1	Taxa with few, poorly known populations on threatened lands.
Priority 2	P2	Taxa with few, poorly known populations on conservation lands.
Priority 3	P3	Taxa with several, poorly known populations, some on conservation lands.
Priority 4	P4	Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.
Priority 5	P5	Taxa in need of monitoring: not considered threatened, but the subject of a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

# **APPENDIX C**

## **DEFINITION OF THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES**



## APPENDIX C

### DEFINITIONS OF THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

#### C1: Definitions of Threatened Ecological Communities

##### Presumed Totally Destroyed (PD)

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 or known or likely habitats **or**
- B) All occurrences recorded within the last 50 years have since been destroyed.

##### Critically Endangered (CR)

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 5 years)
  - ii) modification throughout its range is continuing such that in the immediate future (within approximately 5 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 5 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 which may be capable of being rehabilitated if such work begins in the immediate future (within approximately 5 years)

### Endangered (EN)

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 estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 70% 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 likely in the short term (within approximately 10 years)
  - ii) modification throughout its range is continuing such that in the short term future (within approximately 10 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 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 which may be capable of being rehabilitated if such work begins in the short term future (within approximately 10 years).

### Vulnerable (VU)

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 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 which are likely to be capable of being substantially restored or rehabilitated.
- B) The ecological community can be modified or destroyed 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 still be 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.

Source: Department of Environment and Conservation (2010). *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*. Department of Environment and Conservation, Perth, Western Australia. Online: [www.naturebase.net/](http://www.naturebase.net/)

## **C2: Definitions of Priority Ecological Communities**

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.

Source: Department of Environment and Conservation (2010). *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*. Department of Environment and Conservation, Perth, Western Australia. Online: [www.naturebase.net/](http://www.naturebase.net/)

### **C3: Categories of Threatened Ecological Communities under the EPBC Act.**

Three categories exist for listing threatened ecological communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An ecological community may be categorized as:

**Critically Endangered** ☐ If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.

**Endangered** ☐ If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.

**Vulnerable** ☐ If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future.

**APPENDIX D**

**ENVIRONMENTAL WEEDS AND  
DECLARED PLANT CATEGORIES AND  
INTRODUCED FLORA POTENTIALLY  
OCCURRING IN THE  
PROJECT AREA**

## APPENDIX D

### ENVIRONMENTAL WEEDS AND DECLARED PLANT CATEGORIES AND INTRODUCED FLORA POTENTIALLY OCCURRING IN THE PROJECT AREA

#### D1: Criteria used for Ranking Environmental Weeds

The Environmental Weed Strategy for Western Australia (CALM 1999) contains criteria for the assessment and ranking of weeds in terms of their environmental impact on biodiversity. These criteria are as follows:

- **Invasiveness** – ability to invade bushland in good to excellent condition or ability to invade waterways. (Score as yes or no).
- **Distribution** – wide current or potential distribution including consideration of known history of wide spread distribution elsewhere in the world. (Score as yes or no).
- **Environmental Impacts** – ability to change the structure, composition and function of ecosystems. In particular an ability to form a monoculture in a vegetation community. (Score as yes or no).

The rating of each weed is determined by the following scoring system:

- **High** - a weed species would have to score yes for all three criteria. Rating a weed species as high would indicate prioritising this weed for control and/or research i.e. prioritising funding to it.
- **Moderate** - a weed species would have to score yes for two of the above criteria. Rating a weed species as moderate would indicate that control or research effort should be directed to it if funds are available, however it should be monitored (possibly a reasonably high level of monitoring).
- **Mild** – a weed species scoring one of the criteria. A mild rating would indicate monitoring of the weed and control where appropriate.
- **Low** – a weed species would score none of the criteria. A low ranking would mean that this species would require a low level of monitoring.

Source: Department of Conservation and Land Management (1999). *Environmental Weed Strategy for Western Australia*. Department of Conservation and Land Management, Perth, Western Australia.

## **D2: Standard Meanings of Declared Plant Categories**

### **P1**

Prohibits movement.

The movement of plants or their seeds is prohibited within the State.

This prohibits the movement of contaminated machinery and produce including livestock and fodder.

### **P2**

Aim is to eradicate infestation.

Treat all plants to destroy and prevent propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seed or plant parts on or in livestock, fodder, grain, vehicles and/or machinery.

### **P3**

Aims to control infestation by reducing area and/or density of infestation.

The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.

Treat to destroy and prevent seed set all plants:

- Within 50m inside of the boundaries of the infestation;
- within 50m of roads and high water mark on waterways;
- within 50m of sheds, stock yards and houses.

Treatment must be done prior to seed set each year.

Properties with less than 20ha of infestation must treat the entire infestation.

Additional areas may be ordered to be treated.

### **P4**

Aims to prevent infestation spreading beyond existing boundaries of infestation

The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.

Treat to destroy and prevent seed set all plants:

- within 50m inside of the boundaries of the infested property for one-leaf and 20m for two-leaf;
- within 50m of roads and high water mark on waterways;
- within 50m of sheds, stock yards and houses.



Treatment must be done prior to seed set each year. Properties with less than 20ha of infestation must treat the entire infestation.

Additional areas may be ordered to be treated.

Special considerations: In the case of P4 infestations where they continue across property boundaries there is no requirement to treat the relevant part of the property boundaries as long as the boundaries of the infestation as a whole are treated. There must be agreement between neighbours in relation to the treatment of these areas.

## **P5**

Aims to control infestations on public lands.

Source: Department of Agriculture and Food (2008). *List of Declared Plants*. Department of Agriculture and Food, Western Australia. Online: <http://www.agric.wa.gov.au/>.

### D3: Introduced Flora Species Potentially Occurring in the Project Area

Species	Rating	Description (WAH 2010)
<i>*Acetosa vesicaria</i>	High	Ruby dock Common on roadsides and in disturbed areas in the arid zone.
<i>*Cenchrus ciliaris</i>	High	Buffel Grass Tufted perennial, grass-like or herb, 0.2–1.5m high. White, red or brown sand, stony red loam, black cracking clay.
<i>*Cenchrus setigerus</i>	High	Birdwood grass Weed of watercourses in the Pilbara and Kimberley.
<i>*Cynodon dactylon</i>	Moderate	Couch Prostrate perennial, grass-like or herb, 0.05–0.3m high. Sand, loam, clay.
<i>*Malvastrum americanum</i>	Moderate	Spiked Malvastrum Erect perennial, herb or shrub, 0.5–1.3m high. Variety of soils. Stony ridges and hillsides, floodplains, and along drainage lines.
<i>*Solanum nigrum</i>	Moderate	Black Berry Nightshade Common weed of disturbed woodlands, creeklines and wetlands.
<i>*Sonchus oleraceus</i>	Moderate	Common Sowthistle Common on roadsides and disturbed land.
<i>*Argemone ochroleuca</i>	Mild	Mexican Poppy Widely distributed in pastoral areas, mainly along rivers and in moist flats.
<i>*Echinochloa colona</i>	Mild	Awnless barnyard grass Widespread weed of creeks and swamps in the Pilbara and Kimberley.
<i>*Cenchrus echinatus</i>	Low	Burrgrass Common on disturbed ground and road verges from the Kimberley to the South-West.
<i>*Setaria verticillata</i>	Low	Common and widespread weed of disturbed land, riverine edges and shrublands in the Pilbara.
<i>*Bidens bipinnata</i>	N/A	Bipinnate Beggartick Favours wetlands and is thought to be spread by cattle.

Species	Rating	Description (WAH 2010)
<i>*Cucumis melo</i> subsp. <i>Agrestis</i>	N/A	Ulcardo Melon Trailing annual, herb or climber.
<i>*Sisymbrium orientale</i>	N/A	Indian Hedge Mustard Erect annual or biennial herb.
<i>*Portulaca oleracea</i>	Not Listed	Purslane Succulent, prostrate to decumbent annual, herb.
<i>*Vachellia farnesiana</i>	Not Listed	Mimosa Bush Erect, spreading, thicket-forming, thorny tree or shrub.

# APPENDIX E

## FLORA QUADRAT DATA SHEETS

## APPENDIX E DATA SHEETS

**Ophthalmia**                      **Site**    OP01  
**Described by EC**                      **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50            727487 **mE**            7423551 **mN**

**Habitat**        Mulga plain.

**Soil**             Red-brown loam with cobbles and pebbles scattered on the soil surface.

**Rock Type**

**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland



Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Low Open Woodland of *Acacia citrinoviridis* and *Acacia catenulata* subsp. *occidentalis* with Open Shrubland of *Eremophila forrestii* subsp. *forrestii* and *Sida ectogama*.

**Veg Condition** Pristine.

**Fire Age**        Old.

**Notes**           Aspect: N/A.

Topography: Flat.

Bare Ground: 70%.

Litter Cover: 3% Logs, 2% Twigs, 3% Lvs.

Disturbance: Nearby drill track.

### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>microcarpa</i>	+		3 m	OP01.07
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	2%		1.5-4 m	OP01.01 Flowering.
	<i>Acacia citrinoviridis</i>	10%		4-6 m	OP01.05
	<i>Anthobolus leptomerioides</i>	+		0.8 m	OP01.06
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.1 m	OP01.12
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	5%		1 m	OP01.02
	<i>Grevillea berryana</i>	+		3-4 m	OP01.13
	<i>Ptilotus calostachyus</i>	+		0.3 m	OP01.10
	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	+		1.5 m	OP01.03 3 individuals
	<i>Sarcostemma viminale</i> subsp. <i>australe</i>	+		0.5 m	OP01.15
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		2 m	OP01.08
	<i>Sida ectogama</i>	2%		1.2 m	OP01.04
	<i>Tribulus suberosus</i>	+		1 m	OP01.09
	<i>Triodia melvillei</i>	+		0.3 m	OP01.11

**Ophthalmia**                      **Site**    OP02  
**Described by** BW                                      **Date** 15/05/2010 **Type** Q                                      50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      728704    mE                      7425952    mN

**Habitat**        Plain.

**Soil**             Red-brown loam with covering of cobbles and pebbles on the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) and *Triodia melvillei* with Low Open Woodland of *Eucalyptus gamophylla* with Low Open Shrubland of *Keraudrenia nephrosperma* with Scattered Mallees of *Eucalyptus kingsmillii* subsp. *kingsmillii* with Scattered Tussock Grasses of *Aristida holathera* var. *holathera*.



**Veg Condition**    Excellent.

**Fire Age**         Young.

**Notes**            Aspect: N/A.  
 Topography: Flat.  
 Bare Ground: 60%.  
 Litter Cover: <1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: Nearby tracks.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia kempeana</i>	+		1.2 m	OP02.20 Flowering.
	<i>Acacia pruinocarpa</i>	+		0.4 m	OP02.08
	<i>Acacia sibirica</i>	+		1.2 m	OP02.19 Flowering.
	<i>Aristida holathera</i> var. <i>holathera</i>	1%		0.2 m	OP02.04
	<i>Codonocarpus cotinifolius</i>	+		2-6 m	OP02.13
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	+		3-6 m	OP02.03
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus gamophylla</i>	3%		2-3 m	OP02.21
	<i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>	1%		1.2 m	OP02.05
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		0.2 m	OP02.10
	<i>Hakea chordophylla</i>	+		2.5 m	OP02.06
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	+		0.2 m	OP02.17
	<i>Indigofera monophylla</i>	+		0.3 m	OP02.15 Flowering.
	<i>Keraudrenia nephrosperma</i>	2%		0.4 m	OP02.01 Flowering.
	<i>Paraneurachne muelleri</i>	+		0.2 m	OP02.09
	<i>Ptilotus calostachyus</i>	+		<1 m	OP02.07

<i>Rulingia luteiflora</i>	+	1.5 m	OP02.16
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+	0.4 m	OP02.12
<i>Sida arenicola</i>	+	0.4 m	OP02.24
<i>Sida cardiophylla</i>	+	0.4 m	OP02.22
<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	+	0.4 m	OP02.11
<i>Themeda triandra</i>	+	0.4 m	OP02.23
<i>Triodia melvillei</i>	5%	0.3 m	OP02.18
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	5%	0.3 m	OP02.14





<i>Tribulus suberosus</i>	+	0.4 m	OP01.09
<i>Triodia angusta</i>	10%	0.3 m	OP03.17

Ophthalmia Site OP04

Described by BW

Date 15/05/2010 Type Q

50 x 50 m

Location Ophthalmia.

MGA Zone 50 729465 mE 7425640 mN

Habitat Major Drainage Line.

Soil Red-brown loamy clay with scattered patches of cobbles and pebbles on the soil surface.

Rock Type Ironstone.

Vegetation Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Shrubland of *Petalostylis labicheoides* with Open Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Chrysocephalum apiculatum* with Low Open Woodland of *Corymbia hamersleyana* with Open Shrubland of *Acacia pyrifolia* with Low Open Shrubland of *Eremophila longifolia*.

Veg Condition Excellent.

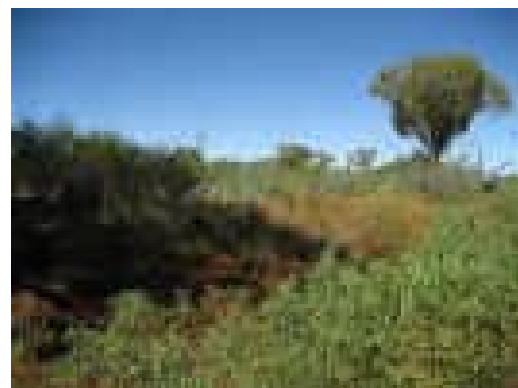
Fire Age Moderate.

Notes Aspect: N/A.

Bare Ground: 40%.

Litter Cover: &lt;1% Logs, 1% Twigs, 4% Lvs.

Disturbance: Grazed by cattle.



## SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon otocarpum</i>	+		<1 m	OP04.09
	<i>Acacia pruinocarpa</i>	+		<1 m	OP02.08
	<i>Acacia pyrifolia</i>	5%		1-3 m	OP04.14
	<i>Capparis lasiantha</i>	+		0.2 m	OP04.01
	<i>Chrysocephalum apiculatum</i>	2%		0.3 m	OP04.06 Flowering.
	<i>Chrysopogon fallax</i>	1%		0.7 m	OP04.19
	<i>Corymbia hamersleyana</i>	5%		8-12 m	OP04.21
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		<1 m	OP04.04
	<i>Eremophila longifolia</i>	2%		<1 m	OP04.16
	<i>Eriachne helmsii</i>	+		<1 m	OP04.13
	<i>Goodenia stellata</i>	+		0.2 m	OP04.02
	<i>Indigofera georgei</i>	+		<1 m	OP04.12
	<i>Isotropis forrestii</i>	+		<1 m	OP04.10
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.2 m	OP04.03
	<i>Petalostylis labicheoides</i>	20%		2-3 m	OP04.17
	<i>Pterocaulon sphaeranthoides</i>	+		<1 m	OP04.07
	<i>Ptilotus exaltatus</i>	+		<1 m	OP04.15
	<i>Rulingia luteiflora</i>	+		1.5 m	OP02.16
	<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+		<1 m	OP04.05

<i>Santalum lanceolatum</i>	+	1.5 m	OP04.20
<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+	<1 m	OP04.08
<i>Sida fibulifera</i>	+	<1 m	OP04.11
<i>Themeda triandra</i>	10%	0.4 m	OP04.18



<i>Sida ectogama</i>	+	1 m	OP01.04
<i>Tribulus suberosus</i>	+	0.5 m	OP01.09
<i>Triodia melvillei</i>	+	0.3 m	OP01.11

Ophthalmia Site OP06

Described by BW Date 15/05/2010 Type Q

50 x 50 m

Location Ophthalmia.

MGA Zone 50 727610 mE 7425111 mN

Habitat Drainage Line.

Soil Red-brown clayey loam with scattered cobbles and pebbles on the soil surface.

Rock Type Ironstone.

Vegetation Broad Floristic Formation: *Triodia* Open Hummock Grassland

Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Open Scrub of *Petalostylis labicheoides* with Scattered Low Trees of *Eucalyptus xerothermica*.

Veg Condition Excellent.

Fire Age Young.

Notes Aspect: N/A.  
Topography: Sloping.  
Bare Ground: 35%  
Litter Cover: <1% Logs, 10% Twigs, 3% Lvs.  
Disturbance: Flooding and Fire.



## SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>microcarpa</i>	+		<1 m	OP06.05
	<i>Acacia monticola</i>	+		1.3 m	OP06.07
	<i>Acacia pruinocarpa</i>	+		<1 m	OP02.08
	<i>Aristida contorta</i>	(+)		0.2 m	NC Associated. Dead.
	<i>Aristida ingrata</i>	+		<1 m	OP06.04
	<i>Chrysopogon fallax</i>	+		<1 m	OP04.19
	<i>Corymbia ferriticola</i>	+		7 m	OP06.06
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eriachne helmsii</i>	+		<1 m	OP04.13
	<i>Eucalyptus xerothermica</i>	1%		8 m	OP06.03
	<i>Gastrolobium grandiflorum</i>	+		1.5 m	OP06.01
	<i>Indigofera monophylla</i>	+		<1 m	OP02.15
	<i>Isotropis forrestii</i>	+		<1 m	OP04.10
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		<1 m	OP04.03
	<i>Keraudrenia nephrosperma</i>	+		<1 m	OP02.01 Flowering.
	<i>Paraneurachne muelleri</i>	+		<1 m	OP02.09
	<i>Petalostylis labicheoides</i>	60%		1.5-2.5 m	OP04.17
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		<1 m	OP06.02 Within the same vegetation (out of plot).

<i>Rulingia luteiflora</i>	+	<1 m	OP02.16
<i>Senna artemisioides subsp. artemisioides</i>	+	<1 m	OP04.08
<i>Themeda triandra</i>	+	<1 m	OP04.18 Flowering.
<i>Triodia melvillei</i>	+	0.3 m	OP02.18 Associated.

**Ophthalmia** Site OP07**Described by** EC **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 728256 mE 7423157 mN**Habitat** Low calcrete hill.**Soil** Salmon brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Calcrete and ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.  
 Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia angusta* with Low Open Shrubland of *Melaleuca eleuterostachya* with Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition** Excellent.**Fire Age** Young.

**Notes** Aspect: South-east.  
 Bare Ground: 70%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: Nearby track.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Aristida holathera</i> var. <i>holathera</i>				OP07.04
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	2%		1-2 m	OP03.03
	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	+		0.1 m	OP07.03 > 1000 individuals.
	<i>Halgania cyanea</i> var. Allambi Stn (B.W. Strong 676)			+	0.3 m OP03.02
	<i>Melaleuca eleuterostachya</i>	3%		0.5 m	OP07.01
	<i>Triodia angusta</i>	10%		0.3 m	OP07.02



**Ophthalmia**                      **Site**    OP08

**Described by** BW    **Date** 15/05/2010 **Type** Q    100 x 10 m

**Location**    Ophthalmia.

**MGA Zone**    50                      728193 **mE**                      7425630 **mN**

**Habitat**        Minor Drainage Line.

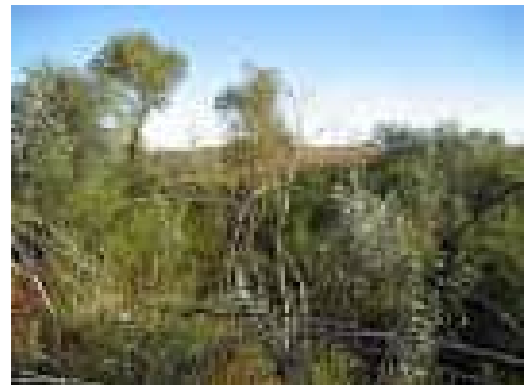
**Soil**             Red-brown loam with scattered cobbles and pebbles on the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Open Heath of *Acacia monticola* and *Santalum lanceolatum* with Very Open Hummock Grassland of *Triodia pungens* with Very Open Mallees of *Eucalyptus gamophylla* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Tussock Grasses of *Eriachne helmsii* and *Themeda triandra*.



**Veg Condition**    Excellent.

**Fire Age**         Young.

**Notes**            Aspect: N/A.  
Bare Ground: 60%.  
Litter Cover: 2% Logs, 8% Twigs, 8% Lvs.  
Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		<1 m	OP08.03	Flowering.
	<i>Acacia ancistrocarpa</i>	+		<1 m	OP08.01	Flowering.
	<i>Acacia monticola</i>	35%		1-2 m	OP06.07	
	<i>Corymbia hamersleyana</i>	3%		6 m	OP04.21	
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1.5 m	OP08.07	
	<i>Duperreya commixta</i>	+		<1 m	OP02.02	
	<i>Eriachne helmsii</i>	1%		0.2 m	OP08.05	
	<i>Eucalyptus gamophylla</i>	5%		2-3m	OP02.21	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		6 m	OP08.08	
	<i>Gastrolobium grandiflorum</i>	+		1.5 m	OP06.01	
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		<1 m	OP02.10	Flowering.
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	+		<1 m	OP08.02	
	<i>Hybanthus aurantiacus</i>	+		<1 m	OP08.06	
	<i>Indigofera monophylla</i>	+		<1 m	OP02.15	
	<i>Ptilotus calostachyus</i>	+		<1 m	OP02.07	
	<i>Santalum lanceolatum</i>	1%		1-2 m	OP04.20	
	<i>Sida arenicola</i>	+		<1 m	OP02.24	
	<i>Themeda triandra</i>	1%		<1 m	OP04.18	

*Triodia pungens*

10%

0.2 m OP08.04 Flowering.

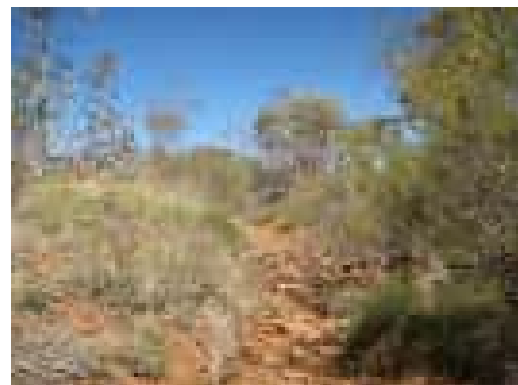
**Ophthalmia**                      **Site**    OP09**Described by** EC    **Date** 15/05/2010 **Type** Q

100 x 25 m

**Location**    Ophthalmia.**MGA Zone**    50                      730182 **mE**                      7423374 **mN****Habitat**        Minor drainage line with incised channel.**Soil**             Light orange-brown loam with cobbles and pebbles covering the soil surface. Some exposed**Rock Type**    Ironstone, quartz and calcrete.**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Tussock Grassland of *Eulalia aurea* and *Themeda triandra* with High Open Shrubland of *Acacia steedmanii* subsp. *borealis* and *Eucalyptus xerothermica* with Very Open Hummock Grassland of *Triodia angusta* with Very Open Mallees of *Eucalyptus trivalva* with Scattered Shrubs of *Acacia dictyophleba* and *Eremophila longifolia*.

**Veg Condition**    Excellent.**Fire Age**         Moderate.**Notes**            Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, 3% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia</i> aff. <i>adsurgens</i>	+		1-2 m	OP09.01	Flowering. Inflorescence too open.
	<i>Acacia dictyophleba</i>	1%		1-2 m	OP09.10	
	<i>Acacia steedmanii</i> subsp. <i>borealis</i>	3%		2.5 m	OP09.06	
	<i>Acacia tetragonophylla</i>	+		1.5 m	OP03.11	
	<i>Bidens bipinnata</i>	+		0.1 m	OP09.19	
	<i>Cleome viscosa</i>	+		0.2 m	NC	
	<i>Corchorus tridens</i>	+		0.1 m	OP09.12	
	<i>Eremophila longifolia</i>	1%		1-2 m	OP09.02	Flowering.
	<i>Eucalyptus trivalva</i>	2%		1-3 m	OP09.04	
	<i>Eucalyptus xerothermica</i>	2%		2-4 m	OP09.03	
	<i>Eulalia aurea</i>	10%		0.4 m	OP09.09	
	<i>Euphorbia coghlanii</i>	+		0.1 m	OP09.18	
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	+		0.3 m	OP09.05	
	<i>Gossypium sturtianum</i>	+		0.3 m	OP09.11	
	<i>Haloragis gosseii</i> var. <i>gossei</i>	+		0.1 m	OP09.13	
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.5 m	OP09.07	
	<i>Peripleura arida</i>	+		0.3 m	OP09.17	
	<i>Rulingia luteiflora</i>	+		1 m	OP03.06	
	<i>Senna pleurocarpa</i> var. <i>angustifolia</i>	+		0.3 m	OP09.16	
	<i>Sida</i> aff. <i>fibulifera</i>	+		0.2 m	OP09.14	inadequate

<i>Streptoglossa bubakii</i>	+	0.2 m	OP09.15
<i>Themeda triandra</i>	5%	0.3 m	OP15.16
<i>Triodia angusta</i>	5%	0.4 m	OP09.08

**Ophthalmia** Site OP10  
**Described by EC** Date 16/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50 728755 mE 7424913 mN

**Habitat** Mulga plain.

**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland



Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: High Open Shrubland of *Acacia catenulata* subsp. *occidentalis*, *Acacia aneura* var. *intermedia*, *Acacia citrinoviridis* and *Acacia aneura* var. *microcarpa* with Very Open Hummock Grassland of *Triodia melvillei* with Scattered Shrubs of *Acacia pruinocarpa*.

**Veg Condition** Excellent.

**Fire Age** Moderate.

**Notes** Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 2% Logs, 2% Twigs, 3% Lvs.

Disturbance: Cattle.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.2 m	OP11.11
	<i>Acacia aneura</i> var. <i>intermedia</i>	5%		1-4 m	OP10.10
	<i>Acacia aneura</i> var. <i>microcarpa</i>	1%		2-5 m	OP01.07
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	5%		1-4 m	OP10.08
	<i>Acacia citrinoviridis</i>	2%		2-5 m	OP01.05
	<i>Acacia pruinocarpa</i>	1%		1 m	OP05.09
	<i>Anthobolus leptomerioides</i>	+		1 m	OP01.06
	<i>Bidens bipinnata</i>	+		0.1 m	OP09.19
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	(+)		0.1 m	OP01.12
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Enchylaena tomentosa</i>	+		0.4 m	OP10.15
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+		1 m	OP01.02
	<i>Eremophila lanceolata</i>	+		0.5 m	OP10.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		0.1 m	OP10.14
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		1 m	OP10.11
	<i>Maireana tomentosa</i>	+		0.2 m	OP10.02
	<i>Psyrax latifolia</i>	+		1-2 m	OP10.12
	<i>Psyrax suaveolens</i>	+		0.6 m	OP10.06
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08
	<i>Ptilotus calostachyus</i>	+		0.3 m	OP01.10

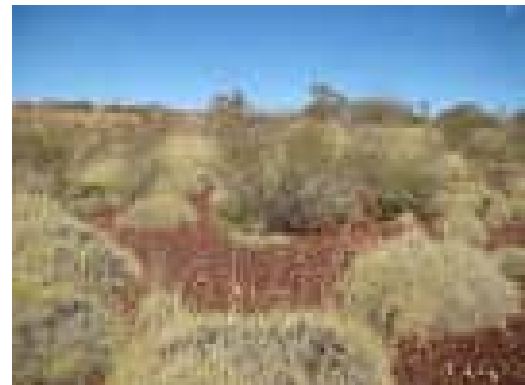
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	+	1 m	OP10.05	1 individual.
<i>Sida ectogama</i>	+	1.2 m	OP10.07	
<i>Sida</i> sp.	+	0.3 m	OP10.03	dark green fruits
<i>Solanum lasiophyllum</i>	+	0.3 m	OP10.13	
<i>Triodia melvillei</i>	7%	0.4 m	OP10.18	

**Ophthalmia**      **Site** OP11**Described by EC**      **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50      729893 **mE**      7423921 **mN****Habitat** Lower hill slope.**Soil** Brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* and *Triodia* aff. *basedowii* with Open Shrubland of *Acacia bivenosa* and *Acacia ancistrocarpa*.

**Veg Condition** Pristine.**Fire Age** Moderate.**Notes** Aspect: West.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia</i> aff. <i>adsurgens</i>	+		1.5 m	OP09.01
	<i>Acacia ancistrocarpa</i>	1%		1.5 m	OP11.02
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.3 m	OP11.11
	<i>Acacia bivenosa</i>	2%		1-2.5 m	OP03.01
	<i>Acacia kempeana</i>	+		1.5 m	OP11.07
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		0.5 m	OP03.11
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila cuneifolia</i>	+		0.3 m	OP11.10
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.3 m	OP11.04
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		0.1 m	OP11.13
	<i>Eriachne pulchella</i> subsp. <i>dominii</i>	+		0.1 m	OP11.14
	<i>Eriachne tenuiculmis</i>	+		0.3 m	OP11.05
	<i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>	+		3 m	OP11.09a
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		3 m	OP11.08
	<i>Keraudrenia nephrosperma</i>	+		0.2 m	OP22.14
	<i>Paraneurachne muelleri</i>	(+)		0.2 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP03.08
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.4 m	OP05.08
	<i>Triodia</i> aff. <i>basedowii</i>	5%		0.3 m	OP11.12
	<i>Triodia wiseana</i>	30%		0.3 m	OP11.03

**Ophthalmia** Site OP12**Described by EC** Date 16/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 729420 mE 7425137 mN**Habitat** Drainage line/ Floodplain.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

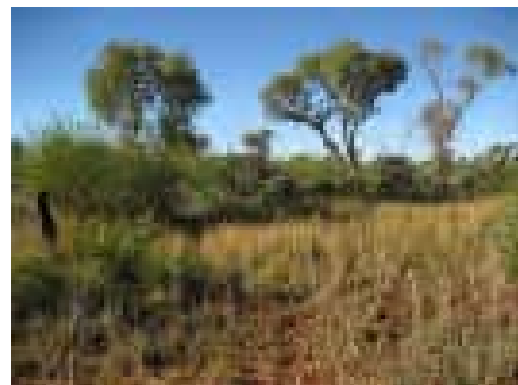
Vegetation Sub-Association: Tussock Grassland of *Themeda triandra* and *Eulalia aurea* with Open Shrubland of *Petalostylis labicheoides*, *Eremophila longifolia*, *Acacia dictyophleba* and *Senna stricta* with Low Open Shrubland of *Chrysocephalum apiculatum*, *Keraudrenia velutina* subsp. *elliptica* and *Dipteracanthus australasicus* subsp. *australasicus* with Low Open Woodland of *Eucalyptus xerothermica* and *Corymbia hamersleyana*.

**Veg Condition** Very Good.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 30%.

Litter Cover: 1% Logs, 2% Twigs, 4% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.5 m	OP11.11	
	<i>Acacia dictyophleba</i>	1%		1 m	OP09.10	
	<i>Acacia pyrifolia</i>	+		1.5 m	OP12.05	
	<i>Alternanthera nana</i>	+		0.1 m	OP12.08	
	<i>Chrysocephalum apiculatum</i>	2%		0.3 m	OP12.02	Flowering.
	<i>Corymbia hamersleyana</i>	1%		6 m	OP12.12	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	2%		0.2 m	OP15.02	Flowering.
	<i>Eremophila longifolia</i>	2%		1 m	OP09.02	
	<i>Eucalyptus xerothermica</i>	2%		2-6 m	OP09.03	
	<i>Eulalia aurea</i>	10%		0.3 m	OP09.09	
	<i>Goodenia stellata</i>	+		0.1 m	OP12.10	
	<i>Grevillea berryana</i>	+		2.5 m	OP01.13	
	<i>Indigofera georgei</i>	+		0.5 m	OP12.09	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	2%		0.3 m	OP03.18	Flowering.
	<i>Petalostylis labicheoides</i>	4%		1-3 m	OP12.01	
	<i>Pterocaulon sphaeranthoides</i>	+		0.2 m	OP12.03	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08	
	<i>Rutidosia helichrysoides</i>	+		0.3 m	OP12.04	
	<i>Salsola tragus</i>	+		0.2 m	NC	
	<i>Sclerolaena cornishiana</i>	+		0.1 m	OP12.11	



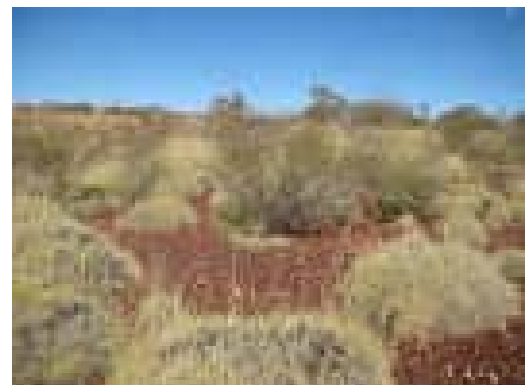
<i>Senna stricta</i>	1%	1 m	OP03.13
<i>Sida fibulifera</i>	+	0.2 m	OP12.06
<i>Themeda triandra</i>	30%	0.5 m	OP12.07

**Ophthalmia**                      **Site**    OP13**Described by** EC    **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      730811    mE                      7423821    mN**Habitat**        Low hill slope.**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* *brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica* with Very Open Hummock Grassland of *Triodia wiseana* with Low Open Shrubland of *Eremophila jucunda* subsp. *pulcherrima* and *Acacia aneura* var. *aneura* with Scattered Shrubs of *Acacia tetragonophylla*.

**Veg Condition** Pristine.**Fire Age**        Old.

**Notes**            Aspect: North-east.  
 Bare Ground: 60%.  
 Litter Cover: 1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	1%		0.5 m	OP11.11
	<i>Acacia aneura</i> var. <i>intermedia</i>	+		0.5 m	OP13.07
	<i>Acacia aneura</i> var. <i>microcarpa</i>	+		4 m	OP01.07
	<i>Acacia bivenosa</i>	+		1-2 m	OP03.01
	<i>Acacia kempeana</i>	+		1.5 m	OP11.06
	<i>Acacia maitlandii</i>	+		0.5 m	OP13.09
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	1%		1-3 m	OP03.11
	<i>Aristida</i> sp.	(+)		0.2 m	NC
	<i>Capparis lasiantha</i>	+		0.3 m	OP13.08
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	1%		0.3 m	OP11.04
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1 m	OP13.02
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		1-2 m	OP13.03
	<i>Eriachne pulchella</i> subsp. <i>dominii</i>	+		0.1 m	OP11.14
	<i>Eriachne tenuiculmis</i>	+		0.3 m	OP11.05
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	10%		1-4 m	OP03.03
	<i>Maireana georgei</i>	+		0.3 m	OP13.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08
	<i>Rhagodia eremaea</i>	+		0.3 m	OP13.05
	<i>Scaevola spinescens</i>	+		0.5 m	OP13.06
	<i>Triodia wiseana</i>	4%		0.4 m	OP13.04



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<i>Gossypium sturtianum</i>	+	0.3 m	OP09.11
<i>Grevillea berryana</i>	2%	1 m	OP01.13
<i>Grevillea striata</i>	+	0.5 m	OP15.07
<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	0.3 m	OP09.07
<i>Malvastrum americanum</i>	+	0.3 m	OP15.19
<i>Ptilotus obovatus</i>	+	0.5 m	OP15.08
<i>Rhyncharrhena linearis</i>	+	CR	OP15.10
<i>Santalum lanceolatum</i>	+	1 m	OP22.16
<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+	1.5 m	OP15.13
<i>Sida ectogama</i>	+	0.3 m	OP15.11
<i>Sida fibulifera</i>	+	0.3 m	OP15.01
<i>Themeda triandra</i>	25%	0.3 m	OP15.16
<i>Triodia angusta</i>	20%	0.4 m	OP15.04
<i>Triodia wiseana</i>	5%	0.4 m	OP15.03

**Ophthalmia** Site OP16**Described by EC** Date 16/05/2010 **Type Q**

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 730901 **mE** 7425622 **mN****Habitat** Hilltop/ Sscree slope.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Hummock Grassland of *Triodia melvillei* and *Triodia* aff. *basedowii* with Very Open Mallees of *Eucalyptus gamophylla* with Open Shrubland of *Acacia hamersleyensis*, *Acacia ancistrocarpa* and *Rulingia luteiflora* with Scattered Tall Shrubs of *Acacia kempeana*.

**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 30%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	1%		1-2 m	OP11.02	
	<i>Acacia bivenosa</i>	+		1-3 m	OP03.01	
	<i>Acacia hamersleyensis</i>	1%		1-2 m	OP16.01	
	<i>Acacia kempeana</i>	1%		1-2.5 m	OP16.02	
	<i>Acacia paraneura</i>	+		1.5 m	OP26.02	
	<i>Acacia pruinocarpa</i>	+		1.2 m	OP05.09	
	<i>Aristida contorta</i>	+		0.2 m	OP16.05	
	<i>Chrysocephalum pterochaetum</i>	+		0.2 m	OP16.10	
	<i>Codonocarpus cotinifolius</i>	+		4 m	NC	
	<i>Cymbopogon obtectus</i>	+		0.3 m	OP16.06	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eucalyptus gamophylla</i>	4%		2-4 m	OP16.03	
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP16.04	
	<i>Psydrax latifolia</i>	+		1 m	OP10.12	
	<i>Psydrax suaveolens</i>	+		0.5 m	OP10.06	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP03.08	
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03	
	<i>Rulingia luteiflora</i>	1%		1.8 m	OP03.06	
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+		0.3 m	OP16.13	Flowering.
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.4 m	OP16.09	

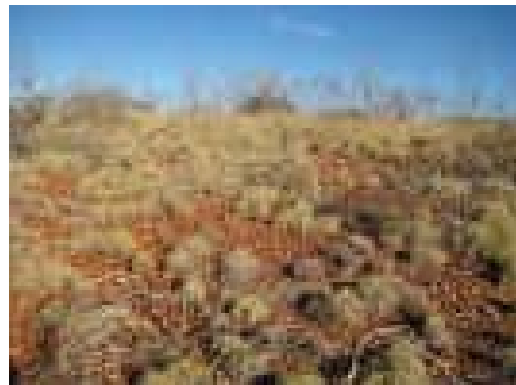
<i>Senna stricta</i>	+	0.3 m	OP03.13
<i>Triodia aff. basedowii</i>	15%	0.4 m	OP16.08
<i>Triodia melvillei</i>	25%	0.4 m	OP16.12

**Ophthalmia** Site OP17**Described by** EC **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 730809 mE 7422703 mN**Habitat** Small low hilltop/ slope.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* *brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia* *brizoides* with Open Shrubland of *Acacia bivenosa* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition** Excellent.**Fire Age** Moderate.

**Notes** Aspect: N/A (hilltop), north-west (slope).  
 Bare Ground: 50%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: Track nearby.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	3%		1-2.5 m	OP03.01
	<i>Acacia kempeana</i>	+		1.5-3 m	OP17.05
	<i>Acacia synchronicia</i>	+		0.5-1 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		1.5 m	OP03.11
	<i>Codonocarpus cotinifolius</i>	+		0.5 m	OP17.06
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		1 m	OP17.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		3 m	OP11.08
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		3 m	OP03.03
	<i>Grevillea wickhamii</i>	+		1.5 m	OP17.03
	<i>Keraudrenia nephrosperma</i>	+		0.3 m	OP22.14
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.3 m	OP17.01
	<i>Psydrax latifolia</i>	+		0.2 m	OP17.07
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP03.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP03.07
	<i>Senna stricta</i>	+		1 m	OP03.13
	<i>Triodia brizoides</i>	40%		0.3 m	OP17.04

**Ophthalmia** Site OP18**Described by** CS **Date** 19/05/2010 **Type** Q

100 x 25 m

**Location** Ophthalmia.**MGA Zone** 50 730256 mE 7425477 mN**Habitat** Minor drainage line.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Low Open Heath of *Keraudrenia velutina* subsp. *elliptica* and *Goodenia microptera* with Tussock Grassland of *Eulalia aurea*, *Themeda triandra* and *Paraneurachne muelleri* with Open Mallees of *Eucalyptus repullulans* and *Eucalyptus gamophylla* with Open Shrubland of *Senna ferraria*, *Rulingia luteiflora* and *Jasminum didymum* subsp. *lineare* with Scattered Hummock Grasses of *Triodia melvillei*.

**Veg Condition** Excellent.**Fire Age** Young.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: 1% Logs, 1% Twigs, 5% Lvs.

Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia pachyacra</i>	+		0.6 m	OP23.01
	<i>Acacia tumida</i> var. <i>pilbarensis</i>	+		1 m	NC
	<i>Bonamia rosea</i>	+		0.2 m	OP104.01
	<i>Chrysopogon fallax</i>	+		1 m	NC Flowering.
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eucalyptus gamophylla</i>	1%		1.5 m	NC
	<i>Eucalyptus repullulans</i>	10%		2 m	OP47.01
	<i>Eulalia aurea</i>	20%		0.5 m	OP09.09 Flowering.
	<i>Goodenia microptera</i>	5%		0.3 m	OP52.04
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	+		0.4 m	OP18.05
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	1%		CR	OP09.07 Flowering.
	<i>Keraudrenia nephrosperma</i>	+		0.4 m	OP22.14
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	35%		0.4 m	OP03.18 Flowering.
	<i>Mirbelia viminalis</i>	+		1 m	OP104.02
	<i>Paraneurachne muelleri</i>	5%		0.3 m	OP23.04
	<i>Rulingia luteiflora</i>	1%		1.5 m	OP03.06
	<i>Senna ferraria</i>	1%		1 m	OP18.01
	<i>Sida arenicola</i>	+		1 m	OP18.04



<i>Sida pilbarensis</i> (ferruginous form)	+	0.6 m	OP18.06	
<i>Sida</i> sp. <i>Excedentifolia</i> (J.L. Egan 1925)	+	0.4 m	OP18.02	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	+	0.5 m	OP18.03	not ferrus form
<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06	
<i>Themeda triandra</i>	10%	0.5 m	OP15.16	Flowering.
<i>Triodia melvillei</i>	1%	0.5 m	OP01.11	

**Ophthalmia**                      **Site**    OP19**Described by** CS    **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      727600 **mE**                      7424441 **mN****Habitat**        Rocky plain (slight slope).**Soil**             Red-brown clayey loam with cobbles on the soil surface.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Triodia* Open Hummock  
Grassland

Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Acacia pruinocarpa* and *Acacia aneura* var. *microcarpa* with Open Shrubland of *Acacia aneura* var. *aneura* and *Eremophila forrestii* subsp. *forrestii* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola*.

**Veg Condition**    Excellent.**Fire Age**        Old.

**Notes**            Aspect: N/A (to slightly north).  
Bare Ground: 60%.  
Litter Cover: 2% Logs, 1% Twigs, 1% Lvs.  
Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		1.5 m	OP19.03
	<i>Acacia aneura</i> var. <i>aneura</i>	3%		1-2 m	OP11.11
	<i>Acacia aneura</i> var. <i>microcarpa</i>	2%		4 m	OP19.04
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1.5 m	OP01.14
	<i>Acacia pruinocarpa</i>	5%		3 m	OP05.09
	<i>Anthobolus leptomerioides</i>	+		1 m	OP01.06
	<i>Codonocarpus cotinifolius</i>	+		3.5 m	OP17.06
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		5 m	OP05.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	1%		1 m	OP01.02
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		1 m	OP41.01
	<i>Grevillea berryana</i>	+		2 m	OP01.13
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	1%		0.6 m	OP03.08
	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	+		1 m	OP01.03 2 individuals.
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.5 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.5 m	OP03.07
	<i>Sida ectogama</i>	+		0.5 m	OP01.04
	<i>Sida</i> sp.	+		0.4 m	OP19.02 dark green fruits

<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06
<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	+	0.8 m	OP19.05
<i>Triodia pungens</i>	40%	0.5 m	OP19.01

**Ophthalmia**                      **Site**    OP20  
**Described by** EC                                      **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      730236 **mE**                      7424828 **mN**

**Habitat**        Low hilltop.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Very Open Tussock Grassland of *Amphipogon sericeus* (Newman form BR2-21) with Low Open Shrubland of *Keraudrenia velutina* subsp. *elliptica* and *Scaevola parvifolia* subsp. *pilbarae* with Open Shrubland of *Acacia bivenosa* and *Acacia pachyacra* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*.



**Veg Condition** Pristine.

**Fire Age**        Old.

**Notes**            Aspect: N/A.  
 Bare Ground: 75%.  
 Litter Cover: 1% Logs, 1% Twigs, 3% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

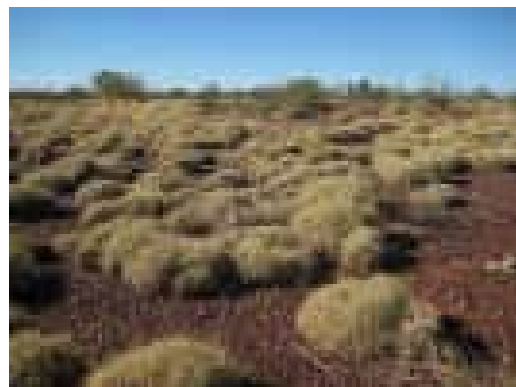
Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	+		0.5-1 m	OP11.02	
	<i>Acacia bivenosa</i>	2%		0.5-2 m	OP03.01	
	<i>Acacia pachyacra</i>	1%		0.5-2.5 m	OP20.03	
	<i>Acacia synchronicia</i>	+		0.3 m	OP11.01	
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	10%		0.3 m	OP20.04	
	<i>Codonocarpus cotinifolius</i>	+		1 m	NC	
	<i>Cymbopogon obtectus</i>	+		0.3 m	OP20.02	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		6 m	OP11.08	
	<i>Goodenia stobbsiana</i>	(+)		0.3 m	NC	
	<i>Hakea chordophylla</i>	+		2 m	OP26.05	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	3%		0.3 m	OP20.01	Flowering.
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08	
	<i>Ptilotus calostachyus</i>	+		0.2 m	NC	
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03	
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	1%		0.3 m	OP16.13	
	<i>Solanum lasiophyllum</i>	+		0.5 m	OP10.13	
	<i>Triodia pungens</i>	1%		0.3 m	OP26.07	
	<i>Triodia sp.</i> Shovelanna Hill (S. van Leeuwen 3835)	20%		0.3 m	OP26.11	

**Ophthalmia** Site OP21**Described by** CS **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 728491 mE 7424224 mN**Habitat** Low rise.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone, granite and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia pruinocarpa*, *Acacia tetragonophylla*, *Acacia aneura* var. *aneura* and *Acacia bivenosa* with Very Open Tussock Grassland of *Paraneurachne muelleri* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition** Excellent.**Fire Age** Young.

**Notes** Aspect: North.  
 Bare Ground: 70%.  
 Litter Cover: <1% Logs, 1% Twigs, <1% Lvs.  
 Disturbance: Fire and horses.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	1%		1.5-2 m	OP11.11
	<i>Acacia bivenosa</i>	1%		1.5 m	OP03.01
	<i>Acacia inaequilatera</i>	+		1.5 m	OP49.03
	<i>Acacia kempeana</i>	+		1 m	OP11.06
	<i>Acacia pruinocarpa</i>	3%		1.5-2 m	OP05.09
	<i>Acacia synchronicia</i>	+		0.7-1.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	1%		1 m	OP03.11
	<i>Aristida contorta</i>	(+)		0.3 m	NC
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+		1.5 m	OP01.02
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		1 m	OP13.03
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		0.4 m	OP17.02
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	+		1.5 m	OP03.03
	<i>Heliotropium inexplicitum</i>	+		0.1 m	OP21.07
	<i>Hibiscus haynaldii</i>	+		0.5 m	OP21.02
	<i>Hibiscus sturtii</i> var. ? <i>campylochlamys</i>	+		0.3 m	OP21.05
	<i>Keraudrenia nephrosperma</i>	+		0.4 m	OP22.14
	<i>Paraneurachne muelleri</i>	2%		0.4 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Ptilotus exaltatus</i>	(+)		0.4 m	NC
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03

<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+	0.5 m	OP21.06
<i>Senna artemisioides</i> subsp. <i>oligophylla x helmsii</i>	+	0.5 m	OP21.04
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	OP03.07
<i>Senna stricta</i>	+	1 m	OP03.13
<i>Solanum horridum</i>	+	0.4 m	OP03.14
<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	(+)	0.3 m	NC
<i>Triodia wiseana</i>	30%	0.5 m	OP21.01

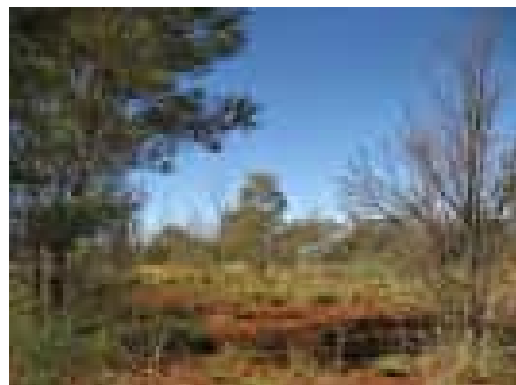
**Ophthalmia**                      **Site**    OP22**Described by** EC    **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      731543 **mE**                      7425868 **mN****Habitat**        Drainage line/ Floodplain.**Soil**             Red-brown clayey loam.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Tussock Grassland of *Themeda triandra*, *Eragrostis eriopoda* and *Chrysopogon fallax* with Open Shrubland of *Acacia citrinoviridis*, *Rulingia luteiflora*, *Acacia elachantha*, *Acacia aneura* var. *aneura* and *Eremophila longifolia* with High Open Shrubland of *Acacia aneura* var. *intermedia* with Very Open Hummock Grassland of *Triodia melvillei* with Scattered Mallees of *Eucalyptus gamophylla* with Scattered Low Shrubs of *Keraudrenia velutina* subsp. *elliptica*.

**Veg Condition**    Very Good.**Fire Age**         Moderate.**Notes**            Aspect: North.

Bare Ground: 70%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: Horses and cattle.

Notes: Lots of dead standing trees/ shrubs from a patchy fire burn.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Abutilon otocarpum</i>	+		0.3 m	OP22.05	
	<i>Acacia adsurgens</i>	+		1.5 m	OP22.08	
	<i>Acacia ancistrocarpa</i>	+		0.5 m	OP11.02	
	<i>Acacia aneura</i> var. <i>aneura</i>	1%		0.5-1.5 m	OP22.10	
	<i>Acacia aneura</i> var. <i>intermedia</i>	2%		3-5 m	OP10.10	
	<i>Acacia citrinoviridis</i>	1%		1-3 m	OP01.05	
	<i>Acacia elachantha</i>	1%		1-3 m	OP22.03	
	<i>Acacia maitlandii</i>	+		1 m	OP22.13	
	<i>Acacia pachyacra</i>	+		1.5 m	OP22.11	
	<i>Aristida holathera</i> var. <i>holathera</i>	+		0.3 m	OP22.06	
	<i>Chrysocephalum pterochaetum</i>	+		0.3 m	OP16.10	
	<i>Chrysopogon fallax</i>	2%		0.3 m	OP22.07	
	<i>Codonocarpus cotinifolius</i>	+		2 m	OP17.06	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>			6 m	OP05.01	Within the same vegetation association (out of plot).
	<i>Duperreya commixta</i>	+		CL	OP03.05	

<i>Eragrostis eriopoda</i>	3%	0.2 m	OP22.01	
<i>Eremophila longifolia</i>	1%	1-1.5 m	OP09.02	
<i>Eucalyptus gamophylla</i>	1%	3 m	NC	
<i>Gastrolobium grandiflorum</i>	+	1-2 m	OP22.04	
<i>Hibiscus burtonii</i>	+	0.3 m	OP22.09	
<i>Keraudrenia nephrosperma</i>	+	0.3 m	OP22.14	
<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	1%	0.5 m	OP03.18	
<i>Maireana tomentosa</i>	+	0.1 m	OP10.02	
<i>Psydrax latifolia</i>	+	0.4 m	OP10.12	
<i>Psydrax suaveolens</i>	+	0.2 m	OP10.06	
<i>Pterocaulon sphaeranthoides</i>	+	0.3 m	OP12.03	
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.3 m	OP03.08	
<i>Ptilotus obovatus</i>	+	0.5 m	OP22.12	
<i>Rhagodia eremaea</i>	+	1.5 m	OP13.05	
<i>Rulingia luteiflora</i>	1%	1-2.5 m	OP03.06	
<i>Rutidosia helichrysoides</i>	+	0.3 m	OP12.04	
<i>Santalum lanceolatum</i>	+	2 m	OP22.16	
<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+	0.3 m	OP16.13	
<i>Sida fibulifera</i>	+	0.3 m	OP22.02	
<i>Sida</i> sp.	+	0.2 m	OP10.03	dark green fruits
<i>Themeda triandra</i>	30%	0.4 m	OP15.16	
<i>Triodia melvillei</i>	2%	0.3 m	OP16.07	



Ophthalmia Site OP23

Described by CS Date 16/05/2010 Type Q

50 x 50 m

Location Ophthalmia.

MGA Zone 50 729338 mE 7424058 mN

Habitat Low rise.

Soil Red-brown loam with cobbles and pebbles covering the soil surface. Some exposed conglomerate.

Rock Type Ironstone and calcrete.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Very Open Tussock Grassland of *Themeda triandra* and *Paraneurachne muelleri* with Open Shrubland of *Acacia pachyacra*, *Acacia citrinoviridis* and *Acacia dictyophleba* with Low Open Shrubland of *Ptilotus astrolasius* var. *astrolasius* and *Acacia kempeana*.



Veg Condition Excellent.

Fire Age Moderate.

Notes Aspect: N/A.

Bare Ground: 70%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: Horses.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11
	<i>Acacia citrinoviridis</i>	1%			OP01.05
	<i>Acacia dictyophleba</i>	1%		1.5 m	OP09.10
	<i>Acacia kempeana</i>	1%		0.4 m	OP11.06
	<i>Acacia pachyacra</i>	2%		2 m	OP23.01
	<i>Acacia pruinocarpa</i>	+		2 m	OP05.09
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Aristida contorta</i>	(+)		0.3 m	NC
	<i>Codonocarpus cotinifolius</i>	+		3 m	OP17.06
	<i>Cymbopogon obtectus</i>	+		0.4 m	OP23.03
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.7 m	OP11.04
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		0.5 m	OP17.02
	<i>Goodenia stobbsiana</i>	(+)		0.4 m	NC
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2.5 m	OP23.02
	<i>Hibiscus haynaldii</i>	+		0.6 m	OP21.02
	<i>Hibiscus sturtii</i> var. ? <i>campylochlamys</i>	+		0.4 m	OP21.05
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		1 m	OP03.18 Flowering.
	<i>Paraneurachne muelleri</i>	5%		0.4 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	1%		0.5 m	OP03.08

<i>Ptilotus exaltatus</i>	(+)	0.4 m	NC	
<i>Ptilotus rotundifolius</i>	+	0.6 m	OP21.03	
<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+	0.4 m	OP21.06	
<i>Sclerolaena cornishiana</i>	+	0.3 m	OP23.05	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+	0.5 m	OP21.04	
<i>Sida</i> aff. <i>fibulifera</i>	+	0.3 m	OP23.06	inadequate
<i>Solanum horridum</i>	+	0.2 m	OP03.14	
<i>Solanum lasiophyllum</i>	+	0.4 m	OP19.06	
<i>Themeda triandra</i>	5%	0.4 m	OP15.16	
<i>Triodia wiseana</i>	20%	0.4 m	OP21.01	

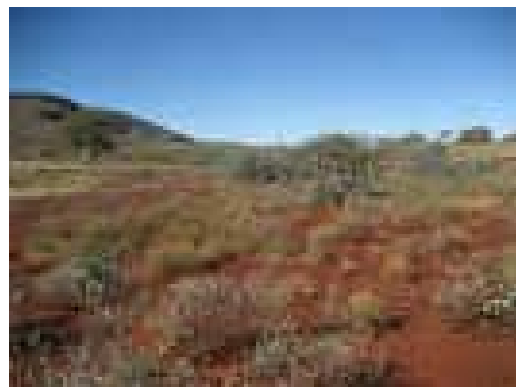
**Ophthalmia** Site OP24**Described by** EC **Date** 16/05/2010 **Type** Q

100 x 25 m

**Location** Ophthalmia.**MGA Zone** 50 731559 mE 7425420 mN**Habitat** Minor drainage line.**Soil** Red-brown loam (some clay) with cobbles and pebbles cover the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Keraudrenia* Low Shrubland

Vegetation Association: Low Shrubland of *Keraudrenia velutina* subsp. *elliptica*, *Rulingia luteiflora* and *Indigofera monophylla* with Open Hummock Grassland of *Triodia melvillei* and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla*, *E. kingsmillii* subsp. *kingsmillii* and *E. repullulans* on Red-brown loam with a covering of cobbles and pebbles on Hill Slopes.

Vegetation Sub-Association: Low Open Heath of *Keraudrenia velutina* subsp. *elliptica*, *Gastrolobium grandiflorum* and *Scaevola parvifolia* subsp. *pilbarae* with Very Open Mallees of *Eucalyptus gamophylla* with Very Open Tussock Grassland of *Eriachne mucronata* and *Cymbopogon obtectus* with Scattered Hummock Grasses of *Triodia pungens*.

**Veg Condition** Excellent.**Fire Age** Young to Moderate.

**Notes** Aspect: N/A.  
Bare Ground: 30%.  
Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia elachantha</i>	+		1.2 m	OP24.06
	<i>Acacia pachyacra</i>	+		1.5 m	OP20.03
	<i>Cymbopogon obtectus</i>	1%		0.3 m	OP24.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eriachne mucronata</i>	2%		0.3 m	OP24.02
	<i>Eucalyptus gamophylla</i>	4%		1-3 m	NC
	<i>Gastrolobium grandiflorum</i>	1%		0.5-1 m	OP24.03
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	30%		0.3 m	OP03.18
	<i>Psyrax suaveolens</i>	+		0.5 m	OP10.06
	<i>Rulingia luteiflora</i>	+		1.5 m	OP03.06
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+	(2%)	0.3 m	OP16.13
	<i>Triodia pungens</i>	1%		0.3 m	OP24.05

**Ophthalmia**                      **Site**    OP25  
**Described by** CH                                      **Date** 15/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

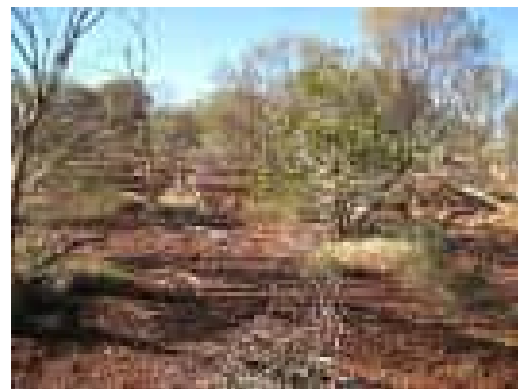
**MGA Zone**    50                      729290 **mE**                      7423500 **mN**

**Habitat**        Plain.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone, quartz and gravel.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp.  
 Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Low Open Forest of *Acacia aneura* var. *aneura* and *Acacia catenulata* subsp. *occidentalis*, *Acacia pruinocarpa* with Open Hummock Grassland of *Triodia melvillei*, *Triodia wiseana* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Scattered Shrubs of *Eremophila phyllopoda* subsp. *obliqua*.



**Veg Condition** Excellent.

**Fire Age**        Old.

**Notes**            Aspect: N/A.  
 Bare Ground: 75%.  
 Litter Cover: <1% Logs, 5% Twigs, 5% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	30%		6 m	OP25.07
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	3%		6 m	OP25.08 Flowering.
	<i>Acacia pruinocarpa</i>	1%		5 m	OP02.08
	<i>Acacia tetragonophylla</i>	+		0.3 m	OP25.02
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	1%		1-2 m	OP25.03
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP25.11
	<i>Maireana triptera</i>	+		0.2 m	OP25.10
	<i>Psydrax latifolia</i>	+		2 m	OP25.01
	<i>Ptilotus exaltatus</i>	+		0.8 m	OP04.15
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1.5 m	OP25.06
	<i>Senna stricta</i>	+		0.9 m	OP25.09
	<i>Tribulus suberosus</i>	+		1 m	OP25.05
	<i>Triodia melvillei</i>	5%		0.6 m	OP02.18
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	2%		0.2 m	OP02.14
	<i>Triodia wiseana</i>	5%		0.4 m	OP25.04

**Ophthalmia** Site OP26

**Described by EC** Date 16/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50 732307 mE 7425810 mN

**Habitat** Lower slope/ Toe of range.

**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia deserticola* subsp. *deserticola* with Scattered Mallees of *Eucalyptus gamophylla* with Scattered Hummock Grasses of *Triodia pungens*.



**Veg Condition** Pristine.

**Fire Age** Moderate.

**Notes** Aspect: South.  
Bare Ground: 50%.  
Litter Cover: <1% Logs, <1% Twigs, 1% Lvs.  
Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		0.3 m	OP26.04
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia monticola</i>	+		0.4 m	OP26.12
	<i>Acacia paraneura</i>	+		0.3 m	OP26.02
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		3 m	OP05.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eriachne tenuiculmis</i>	+		0.1 m	OP26.08
	<i>Eucalyptus gamophylla</i>	1%		2 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		4 m	OP11.08
	<i>Hakea chordophylla</i>	+		1-3 m	OP26.05
	<i>Hybanthus aurantiacus</i>	+		0.3 m	OP26.03
	<i>Keraudrenia nephrosperma</i>	+		0.2 m	OP22.14
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.3 m	OP03.18
	<i>Ptilotus calostachyus</i>	+		0.4 m	NC
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+		0.3 m	OP16.13
	<i>Senna ferraria</i>	+		1 m	OP26.06
	<i>Senna glutinosa</i> subsp. <i>luerssenii</i>	+		1 m	OP26.10
	<i>Sida arenicola</i>	+		1 m	OP26.09

<i>Solanum centrale</i>	+	0.4 m	OP26.01
<i>Triodia pungens</i>	1%	0.3 m	OP26.07
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	45%	0.2 m	OP26.11

**Ophthalmia**                      **Site**    OP27

**Described by** CH    **Date** 16/05/2010 **Type** Q    50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      728770 mE                      7423630 mN

**Habitat**        Lower slope.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.  
 Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia wiseana* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*.



**Veg Condition**    Excellent.

**Fire Age**        Young to Moderate.

**Notes**            Aspect: N/A.  
 Bare Ground: 65%.  
 Litter Cover: <1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1.8 m	OP27.03
	<i>Acacia subtiliformis</i>	+		1.1 m	OP27.04
	<i>Acacia synchronicia</i>	+		1 m	OP27.05
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	15%		2 m	OP27.01
	<i>Triodia wiseana</i>	30%		0.2 m	OP25.04

**Ophthalmia**                      **Site**    OP28  
**Described by** EC                                      **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      733276 **mE**                      7425552 **mN**

**Habitat**        Low hill slope of main ridge.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Very Open Mallees of *Eucalyptus gamophylla* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Corymbia hamersleyana* with Scattered Tall Shrubs of *Hakea chordophylla* with Scattered Shrubs of *Acacia kempeana*.



**Veg Condition** Pristine.

**Fire Age**        Old.

**Notes**            Aspect: South.  
 Bare Ground: 35%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia bivenosa</i>	+		1 m	OP03.01	
	<i>Acacia kempeana</i>	1%		1-2 m	OP28.02	
	<i>Acacia pachyacra</i>	+		1.5 m	OP20.03	
	<i>Acacia paraneura</i>	+		0.4 m	OP26.02	
	<i>Bonamia rosea</i>	+		0.3 m	OP28.06	
	<i>Chrysocephalum pterochaetum</i>	+		0.3 m	OP28.04	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		2-3 m	OP05.01	
	<i>Corymbia hamersleyana</i>	1%		3-4 m	OP11.09	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eucalyptus gamophylla</i>	2%		3.5 m	NC	
	<i>Hakea chordophylla</i>	1%		2-3 m	OP26.05	
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	+		0.3 m	OP28.07	
	<i>Hybanthus aurantiacus</i>	+		0.3 m	OP26.03	Flowering.
	<i>Keraudrenia nephrosperma</i>	+		0.3 m	OP22.14	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.3 m	OP03.18	
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP28.05	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08	
	<i>Ptilotus calostachyus</i>	+		0.3 m	NC	
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+		0.2 m	OP16.13	



<i>Senna glaucifolia</i>	+	1 m	OP28.03
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	1 m	OP28.01
<i>Themeda triandra</i>	+	0.4 m	OP15.16
<i>Triodia pungens</i>	3%	0.4 m	OP28.08
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	40%	0.3 m	OP26.11

**Ophthalmia** Site OP29**Described by** CS **Date** 16/05/2010 **Type** Q

100 x 25 m

**Location** Ophthalmia.**MGA Zone** 50 732602 mE 7424238 mN**Habitat** Drainage line.**Soil** Red-brown loam on banks with deep pebbles in drainage channel.**Rock Type****Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens* with Open Tussock Grassland of *Eulalia aurea*, *Chrysopogon fallax*, *Themeda triandra* and *Paraneurachne muelleri* with High Shrubland of *Acacia citrinoviridis* and *Petalostylis labicheoides* with Low Open Woodland of *Eucalyptus victrix* with Low Open Shrubland of *Dipteracanthus australasicus* subsp. *australasicus*, *Eremophila longifolia* and *Acacia maitlandii* with Scattered Herbs of *Bidens bipinnata*.

**Veg Condition** Excellent to Very Good.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 5% Logs, 5% Twigs, 1% Lvs.

Disturbance: Cattle and introduced species.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia citrinoviridis</i>	10%		4 m	OP01.05	
	<i>Acacia maitlandii</i>	1%		1.5 m	OP22.13	
	<i>Acacia pachyacra</i>	+		1 m	OP23.01	
	<i>Acacia pyrifolia</i>	+		1 m	NC	
	<i>Bidens bipinnata</i>	1%		0.1 m	OP09.19	
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.1 m	OP29.01	
	<i>Chrysopogon fallax</i>	2%		0.7 m	NC	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	2%		0.3 m	OP15.02	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eremophila longifolia</i>	1%		1.5 m	OP09.02	
	<i>Eucalyptus victrix</i>	5%		8 m	OP29.04	
	<i>Eulalia aurea</i>	15%		0.6 m	OP09.09	
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		0.2 m	OP15.06	
	<i>Goodenia stellata</i>	+		0.1 m	OP15.12	
	<i>Gossypium sturtianum</i>	+		1 m	OP09.11	
	<i>Hybanthus aurantiacus</i>	+		0.3 m	OP29.06	Flowering.
	<i>Indigofera georgei</i>	+		0.5 m	OP29.02	
	<i>Isotropis forrestii</i>	+		0.4 m	OP29.03	
	<i>Paraneurachne muelleri</i>	1%		0.4 m	OP35.07	
	<i>Petalostylis labicheoides</i>	3%		1.5 m	OP12.01	

<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.6 m	OP03.08
<i>Rulingia luteiflora</i>	+	2 m	OP03.06
<i>Senna stricta</i>	+	1 m	OP03.13
<i>Themeda triandra</i>	2%	0.6 m	OP15.16
<i>Triodia pungens</i>	20%	0.5 m	OP29.05



<i>Triodia pungens</i>	3%	0.3 m	OP26.07
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	+	0.3 m	OP26.11

**Ophthalmia**                      **Site**    OP31  
**Described by** CH                                      **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50            732170 **mE**            7423780 **mN**

**Habitat**        Low slope.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Shrubland of *Acacia ancistrocarpa* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Tall Shrubs of *Acacia pruinocarpa*.



**Veg Condition** Pristine.

**Fire Age**        Yount to Moderate.

**Notes**            Aspect: N/A.  
 Bare Ground: 50%.  
 Litter Cover: <1% Logs, 3% Twigs, 2% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

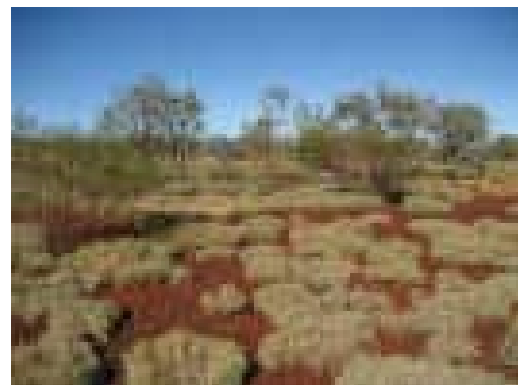
Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	12%		1.5 m	OP08.01
	<i>Acacia marramamba</i>	+		1- m	OP31.05
	<i>Acacia pruinocarpa</i>	1%		2.5 m	OP02.08
	<i>Acacia rhodophloia</i>	+		1-2 m	OP31.01 Flowering.
	<i>Anthobolus leptomerioides</i>	+		1 m	OP31.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		5 m	OP31.04
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		0.4 m	OP02.10
	<i>Grevillea berryana</i>	+		1-2 m	OP31.03
	<i>Triodia melvillei</i>	+		0.4 m	OP02.18
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	45%		0.3 m	OP02.14

**Ophthalmia** Site OP32**Described by** BW **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 734052 mE 7425195 mN**Habitat** Low hill slopes.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) with Very Open Mallees of *Eucalyptus gamophylla* with Low Open Shrubland of *Keraudrenia velutina* subsp. *elliptica*.

**Veg Condition** Pristine.**Fire Age** Moderate to Old.

**Notes** Aspect: N/A.  
 Bare Ground: 35%.  
 Litter Cover: <1% Logs, <1% Twigs, 1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		1 m	OP32.04
	<i>Acacia aneura</i> var. <i>aneura</i>	+		2 m	OP32.05
	<i>Acacia bivenosa</i>	+		1.2 m	OP03.01
	<i>Acacia pachyacra</i>	+		1.7 m	OP20.03
	<i>Acacia pruinocarpa</i>	+		2 m	OP05.09
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	+		0.4 m	OP32.06
	<i>Bonamia rosea</i>	+		0.2 m	OP28.06
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	+		2.7 m	OP05.01
	<i>Corymbia hamersleyana</i>	+		3.2 m	OP11.09
	<i>Eucalyptus gamophylla</i>	3%		2.5-3 m	NC
	<i>Hakea chordophylla</i>	+		2 m	OP26.05
	<i>Keraudrenia nephrosperma</i>	+		0.2 m	OP22.14
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	2%		0.4 m	OP03.18
	<i>Mirbelia viminalis</i>	+		0.3 m	OP32.03
	<i>Paraneurachne muelleri</i>	+		0.2 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Ptilotus calostachyus</i>	(+)		0.7 m	NC
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03
	<i>Rulingia loxophylla</i>	+		0.2 m	OP32.01

<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+ (1%)	0.2 m	OP16.13
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+	0.5 m	OP05.08
<i>Senna glaucifolia</i>	+	1 m	OP32.02
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	0.5 m	OP28.01
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	15%	0.2 m	OP26.11



**Ophthalmia** Site OP33**Described by** CH **Date** 16/05/2010 **Type** Q

10 x 130 m

**Location** Ophthalmia.**MGA Zone** 50 732785 mE 7423800 mN**Habitat** Gully between hills.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp.  
 Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Low Open Forest of *Acacia catenulata* subsp. *occidentalis* and *Eucalyptus leucophloia* subsp. *leucophloia* with Hummock Grassland of *Triodia pungens* with Open Shrubland of *Eremophila phyllopoda* subsp. *obliqua* and *Acacia rhodophloia*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: N/A.  
 Bare Ground: 30%.  
 Litter Cover: <1% Logs, 5% Twigs, 10% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		2 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	60%		4-5 m	OP25.08 Flowering.
	<i>Acacia rhodophloia</i>	1%		2.5 m	OP31.01
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.5 m	OP33.04
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		2.2 m	OP33.03 Flowering.
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	1%		1.3 m	OP25.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		7 m	OP31.04
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1.5 m	OP33.02
	<i>Triodia melvillei</i>	+		0.4 m	OP02.18
	<i>Triodia pungens</i>	40%		0.4 m	OP33.01 Flowering.
	<i>Triodia wiseana</i>	+		0.3 m	OP25.04

Ophthalmia Site OP34

Described by EC Date 16/05/2010 Type Q

100 x 100

Location Ophthalmia.

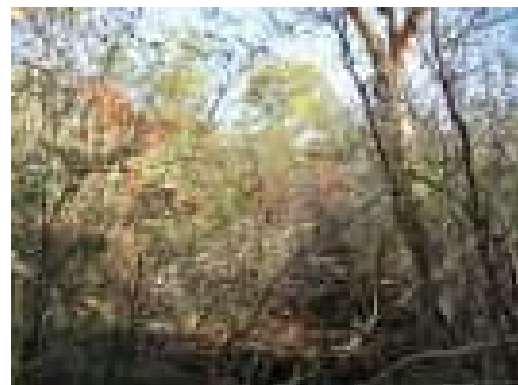
MGA Zone 50 734596 mE 7425709 mN

Habitat Rocky drainage line.

Soil Skeletal red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.

Rock Type Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
Vegetation Association: Hummock Grassland of *Triodia* sp.  
Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia melvillei* with Shrubland of *Acacia monticola*, *Petalostylis labicheoides* and *Dodonaea viscosa* subsp. *mucronata* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with High Open Shrubland of *Grevillea wickhamii* with Scattered Tussock Grasses of *Eriachne tenuiculmis*.



Veg Condition Excellent.

Fire Age Old.

**Notes** Aspect: N/A.  
Bare Ground: 50%.  
Litter Cover: 3% Logs, 5% Twigs, 5% Lvs.  
Disturbance: Track nearby.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia hamersleyensis</i>	+		1 m	OP34.06
	<i>Acacia maitlandii</i>	+		1.5 m	OP22.13
	<i>Acacia monticola</i>	10%		1-3 m	OP26.12
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09
	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>	+		0.3 m	OP34.05
	<i>Corymbia hamersleyana</i>	2%		5-6 m	OP11.09
	<i>Cymbopogon</i> sp.	+		0.2 m	OP34.07 sterile
	<i>Dodonaea viscosa</i> subsp. <i>mucronata</i>	2%		1.5 m	OP34.02
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.5 m	OP34.10
	<i>Eriachne tenuiculmis</i>	1%		0.3 m	OP11.05
	<i>Eucalyptus gamophylla</i>	+		0.5 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		3.5 m	OP11.08
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		0.1 m	OP15.06
	<i>Gossypium robinsonii</i>	+		1 m	OP68.01
	<i>Grevillea wickhamii</i>	2%		2.5 m	OP17.03
	<i>Hibiscus haynaldii</i>	+		1 m	OP34.04
	<i>Indigofera gilesii</i> subsp. <i>gilesii</i>	+		1.5 m	OP34.01
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.3 m	OP09.07

<i>Keraudrenia velutina subsp. elliptica</i>	+	0.3 m	OP03.18
<i>Petalostylis labicheoides</i>	5%	1-2 m	OP12.01
<i>Prostanthera albiflora</i>	+	0.5 m	OP34.03
<i>Rulingia luteiflora</i>	+	0.5 m	OP03.06
<i>Santalum lanceolatum</i>	+	1 m	OP22.16
<i>Scaevola browniana subsp. browniana</i>	+	1 m	OP34.09
<i>Triodia melvillei</i>	15%	0.3 m	OP16.07

**Ophthalmia**                      **Site**    OP35**Described by** CS                                      **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      733376    mE                      7424308    mN**Habitat**        Floodplain.**Soil**             Red-brown clayey loam.**Rock Type****Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Shrubland of *Acacia aneura* var. *aneura*, *Petalostylis labicheoides* and *Eremophila longifolia* with Low Shrubland of *Dipteracanthus australasicus* subsp. *australasicus*, *Ptilotus exaltatus*, *Ptilotus astrolasius* var. *astrolasius*, *Sida fibulifera* and *Eremophila forrestii* subsp. *forrestii* with Very Open Tussock Grassland of *Themeda triandra* and *Chrysopogon fallax*.

**Veg Condition**    Very Good.**Fire Age**        Young.**Notes**            Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 1% Logs, 5% Twigs, 5% Lvs.

Disturbance: Cattle, fire and introduced species.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Abutilon fraseri</i>	+		0.3 m	OP35.04	
	<i>Acacia aneura</i> var. <i>aneura</i>	10%		1.5-2 m	OP11.11	Flowering.
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01	
	<i>Acacia pruinocarpa</i>	+		2 m	OP05.09	
	<i>Bidens bipinnata</i>	+		0.2 m	OP09.19	
	<i>Chrysopogon fallax</i>	5%		1.2 m	NC	
	<i>Cleome viscosa</i>	(+)		0.4 m	NC	
	<i>Cucumis maderaspatanus</i>	+		CR	OP35.02	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	10%		0.3 m	OP15.02	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Enneapogon lindleyanus</i>	+		0.4 m	OP35.11	
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	1%		1 m	OP01.02	
	<i>Eremophila lanceolata</i>	+		1 m	OP35.09	
	<i>Eremophila longifolia</i>	1%		2 m	OP09.02	Flowering.
	<i>Euphorbia ? coghlanii</i>	+		0.2 m	OP35.10	
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	+		0.3 m	OP09.05	
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		0.2 m	OP15.06	
	<i>Heliotropium inexplicitum</i>	+		0.4 m	OP35.08	
	<i>Paraneurachne muelleri</i>	+		0.4 m	OP35.07	
	<i>Petalostylis labicheoides</i>	3%		2 m	OP12.01	

<i>Pterocaulon sphaeranthoides</i>	+	0.3 m	OP35.01	
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	1%	0.6 m	OP03.08	
<i>Ptilotus exaltatus</i>	1%	0.5 m	OP35.05	
<i>Ptilotus obovatus</i>	+	0.6 m	OP15.08	
<i>Rhagodia eremaea</i>	+	0.3 m	OP13.05	1 individual.
<i>Rutidosis helichrysoides</i>	+	0.3 m	OP35.06	
<i>Sclerolaena cornishiana</i>	+	0.5 m	OP23.05	
<i>Senna stricta</i>	+	1.5 m	OP03.13	
<i>Sida fibulifera</i>	1%	CR	OP15.01	
<i>Sida</i> sp. <i>verrucose glands</i> (F.H. Mollemans 2423)	+	0.3 m	OP35.03	
<i>Solanum lasiophyllum</i>	+	0.4 m	OP19.06	
<i>Themeda triandra</i>	5%	0.5 m	OP15.16	
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	(+)	0.4 m	NC	

**Ophthalmia**                      **Site**    OP36  
**Described by**CS                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

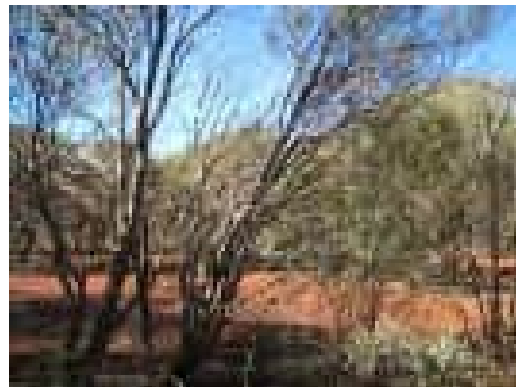
**MGA Zone**    50            734211    mE            7424535    mN

**Habitat**        Plain.

**Soil**             Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Open Hummock Grassland



Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: High Open Shrubland of *Acacia distans*, *Acacia aneura* var. *microcarpa*, *Acacia aneura* var. *intermedia* and *Acacia aneura* var. *microcarpa* with Open Shrubland of *Eremophila forrestii* subsp. *forrestii*, *Sida ectogama* and *Eremophila forrestii* subsp. *forrestii*.

**Veg Condition**    Excellent.

**Fire Age**         Old.

**Notes**            Aspect: N/A.  
                       Bare Ground: 90%.  
                       Litter Cover: 1% Logs, 5% Twigs, 10% Lvs.  
                       Disturbance: Cattle and horses.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>intermedia</i>	2%		3.5 m	OP41.08
	<i>Acacia aneura</i> var. <i>microcarpa</i>	7%		2.5 m	OP36.04
	<i>Acacia distans</i>	20%		4 m	OP36.02 Flowering.
	<i>Anthobolus leptomerioides</i>	+		1.5 m	OP01.06
	<i>Aristida contorta</i>	(+)		0.2 m	NC
	<i>Eragrostis eriopoda</i>	+		0.4 m	OP36.03
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	6%		1.5 m	OP36.01
	<i>Hibiscus haynaldii</i>	+		0.4 m	OP21.02
	<i>Maireana villosa</i>	+		0.3 m	OP36.05
	<i>Rhyncharrhena linearis</i>	+		CL	OP15.10
	<i>Senna glaucifolia</i>	+		0.5 m	OP36.06
	<i>Sida ectogama</i>	1%		1.2 m	OP01.04
	<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)	+		0.3 m	OP36.07
	<i>Triodia melvillei</i>	+		0.4 m	OP01.11

**Ophthalmia** Site OP37**Described by CS** Date 16/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 731195 mE 7424374 mN**Habitat** Drainage line.**Soil** Red-brown clayey loam on the banks with deep pebbles in the river bed.**Rock Type****Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Tussock Grassland of *Eulalia aurea* and *Themeda triandra* with Open Woodland of *Eucalyptus victrix* with Open Shrubland of *Eremophila longifolia* and *Petalostylis labicheoides* with Scattered Tall Shrubs of *Acacia citrinoviridis* with Scattered Low Shrubs of *Dipteracanthus australasicus* subsp. *australasicus* with Scattered Herbs of *\*Bidens bipinnata*.

**Veg Condition** Excellent to Very Good.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 2% Logs, 5% Twigs, 10% Lvs.

Disturbance: Cattle and introduced species.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		2 m	OP11.11	
	<i>Acacia citrinoviridis</i>	1%		3 m	OP01.05	
	<i>Acacia dictyophleba</i>	+		2 m	OP09.10	
	<i>Acacia maitlandii</i>	+		1.5 m	OP22.13	
	<i>Acacia pyrifolia</i>	+		1.5 m	NC	
	<i>Aristida ingrata</i>	+		0.4 m	OP37.06	
	<i>Bidens bipinnata</i>	1%		0.2 m	OP09.19	
	<i>Chrysocephalum apiculatum</i>	+		CR	OP15.14	
	<i>Chrysopogon fallax</i>	+		0.7 m	NC	Flowering.
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	1%		0.3 m	OP15.02	Flowering.
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eremophila longifolia</i>	2%		1 m	OP09.02	Flowering.
	<i>Eucalyptus victrix</i>	7%		10-15 m	OP37.02	
	<i>Eulalia aurea</i>	15%		0.9 m	OP09.09	Flowering.
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		CR	OP15.06	
	<i>Goodenia lamprosperma</i>	+		0.3 m	OP37.05	
	<i>Goodenia stellata</i>	+		0.1 m	OP15.12	
	<i>Gossypium sturtianum</i>	+		1.5 m	OP09.11	
	<i>Ipomoea muelleri</i>	+		<0.1 m	OP37.01	
	<i>Isotropis forrestii</i>	+		0.5 m	OP29.03	

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<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CL	OP09.07
<i>Malvastrum americanum</i>	+	0.3 m	OP37.07
<i>Marsilea hirsuta</i>	+	0.2 m	OP37.04
<i>Paraneurachne muelleri</i>	+	0.4 m	OP35.07
<i>Petalostylis labicheoides</i>	1%	2 m	OP12.01
<i>Phyllanthus maderaspatensis</i>	+	0.3 m	OP37.03
<i>Pterocaulon sphaeranthoides</i>	+	0.5 m	OP35.01
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	1 m	OP03.08
<i>Ptilotus obovatus</i>	+	0.6 m	OP15.08
<i>Rhyncharrhena linearis</i>	+	CR	OP15.10
<i>Rulingia luteiflora</i>	1%	2 m	OP03.06
<i>Senna stricta</i>	+	1 m	OP03.13
<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)	+	0.3 m	OP35.03
<i>Spartothamnella teucriflora</i>	+	0.5 m	OP37.08
<i>Themeda triandra</i>	5%	0.7 m	OP15.16



**Ophthalmia** Site OP38**Described by EC** Date 17/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 732331 mE 7422417 mN**Habitat** Floodplain and drainage line.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface. Clayey loam and exposed bedrock in the drainage line channel.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Tussock Grassland of *Themeda triandra* with Very Open Hummock Grassland of *Triodia pungens* with Open Shrubland of *Petalostylis labicheoides*, *Acacia maitlandii* and *Santalum lanceolatum* with Low Open Woodland of *Eucalyptus xerothermica*.

**Veg Condition** Excellent to Very Good.**Fire Age** Moderate.

**Notes** Aspect: N/A.  
Bare Ground: 50%.  
Litter Cover: 1% Logs, 1% Twigs, 2% Lvs.  
Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		0.5 m	OP03.16
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.4 m	OP11.11
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia dictyophleba</i>	+		0.6 m	OP09.10
	<i>Acacia maitlandii</i>	1%		0.5-2.5 m	OP22.13
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		0.5 m	OP13.02
	<i>Eriachne tenuiculmis</i>	+		0.3 m	OP11.05
	<i>Eucalyptus xerothermica</i>	3%		2-6 m	OP09.03
	<i>Gossypium sturtianum</i>	+		1 m	OP38.01
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2.5 m	OP10.11
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP23.04
	<i>Petalostylis labicheoides</i>	3%		1-3 m	OP12.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP38.03
	<i>Rulingia luteiflora</i>	+		0.5-1 m	OP03.06
	<i>Santalum lanceolatum</i>	1%		0.5-2.5 m	OP22.16
	<i>Senna stricta</i>	+		0.3 m	OP03.13
	<i>Streptoglossa bubakii</i>	+		0.2 m	OP38.02
	<i>Themeda triandra</i>	40%		0.5 m	OP15.16
	<i>Triodia melvillei</i>	+		0.5 m	OP16.07
	<i>Triodia pungens</i>	5%		0.4 m	OP26.07

**Ophthalmia**                      **Site**    OP39  
**Described by** CH                                      **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

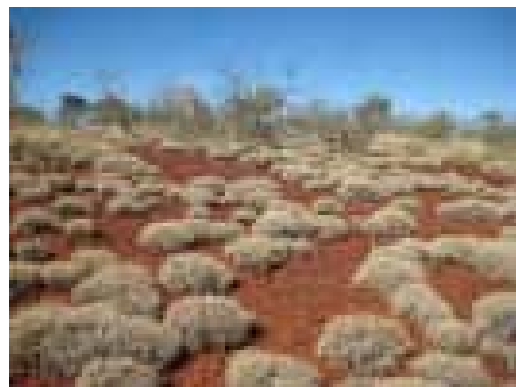
**MGA Zone**    50                      731300 **mE**                      7423320 **mN**

**Habitat**       Hill slope.

**Soil**            Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp.  
 Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Shrubland of *Acacia pruinocarpa*, *Acacia rhodophloia* and *Acacia aneura* var. *aneura*.



**Veg Condition** Pristine.

**Fire Age**       Moderate.

**Notes**           Aspect: North-west.  
 Bare Ground: 60%.  
 Litter Cover: <1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	1%		2 m	OP25.07
	<i>Acacia pruinocarpa</i>	15%		1.8 m	OP02.08
	<i>Acacia rhodophloia</i>	1%		2 m	OP31.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP25.02
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.5 m	OP39.01
	<i>Eremophila longifolia</i>	+		2.8 m	OP04.16
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		1.2 m	OP25.03
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1.5 m	OP33.02
	<i>Triodia pungens</i>	+		0.8 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	25%		0.3 m	OP02.14



**Ophthalmia** Site OP41**Described by** CS **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 730523 mE 7421956 mN**Habitat** Rocky plain.**Soil** Red-brown sandy loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland

Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: High Shrubland of *Acacia citrinoviridis*, *Acacia aneura* var. *microcarpa* and *Acacia kempeana* with Very Open Hummock Grassland of *Triodia pungens* with Open Shrubland of *Eremophila fraseri* subsp. *fraseri* and *Sarcostemma viminale* subsp. *australe* with Scattered Low Shrubs of *Eremophila phyllopoda* subsp. *obliqua*.

**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 90%.

Litter Cover: 2% Logs, 2% Twigs, 15% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>intermedia</i>	+		3 m	OP41.08	
	<i>Acacia aneura</i> var. <i>microcarpa</i>	5%		3 m	OP41.03	
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		2 m	OP01.14	
	<i>Acacia citrinoviridis</i>	5%		4 m	OP01.05	
	<i>Acacia kempeana</i>	2%		4.5 m	OP05.02	
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11	
	<i>Anthobolus leptomerioides</i>	+		1 m	OP01.06	
	<i>Capparis lasiantha</i>	+		1 m	OP03.09	
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.2 m	OP01.12	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	5%		1 m	OP41.01	Flowering.
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		0.9 m	OP13.02	Flowering.
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	1%		0.5 m	OP17.02	
	<i>Grevillea berryana</i>	+		1.5 m	OP01.13	
	<i>Psyrax latifolia</i>	+		1.5 m	OP10.12	
	<i>Psyrax suaveolens</i>	+		0.4 m	OP41.06	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.6 m	OP03.08	
	<i>Santalum lanceolatum</i>	+		1 m	OP41.05	
	<i>Sarcostemma viminale</i> subsp. <i>australe</i>	1%		2 m	OP01.15	

<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+	1 m	OP05.08
<i>Sida ectogama</i>	+	1 m	OP41.02
<i>Tribulus suberosus</i>	+	0.6 m	OP01.09
<i>Triodia pungens</i>	10%	0.5 m	OP41.04

**Ophthalmia**                      **Site**    OP42**Described by** EC    **Date** 17/05/2010 **Type** Q

50 x 50 m

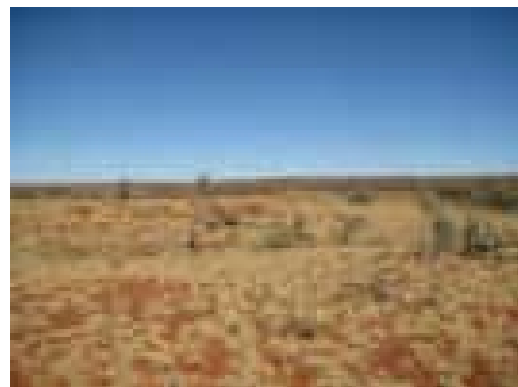
**Location**    Ophthalmia.**MGA Zone**    50                      733695 **mE**                      7422815 **mN****Habitat**        Low rocky undulating hill.**Soil**            Light red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.**Rock Type****Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills.

Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia inaequilatera* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition**    Pristine.**Fire Age**        Young.

**Notes**            Aspect: N/A.  
 Bare Ground: 70%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia dictyophleba</i>	+		0.5 m	OP09.10
	<i>Acacia inaequilatera</i>	2%		0.5-3 m	OP49.03
	<i>Acacia maitlandii</i>	+		0.4 m	OP22.13
	<i>Acacia marramamba</i>	+		0.5 m	OP42.02
	<i>Acacia pachyacra</i>	+		0.5 m	OP20.03
	<i>Acacia tetragonophylla</i>	+		0.5 m	OP03.11
	<i>Codonocarpus cotinifolius</i>	+		1 m	OP17.06
	<i>Cymbopogon obtectus</i>	+		0.3 m	OP20.02
	<i>Duperreya commixta</i>	+		0.3 m	OP03.05
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	+		0.5 m	OP03.03
	<i>Hakea chordophylla</i>	+		0.5 m	OP26.05
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.3 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP42.03
	<i>Sida arenicola</i>	+		0.3 m	OP42.04
	<i>Triodia wiseana</i>	35%		0.2 m	OP42.01

**Ophthalmia**                      **Site**    OP43**Described by** CH    **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      731170 **mE**                      7421870 **mN****Habitat**        Plain.**Soil**             Red-brown clay loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia pruinocarpa* and *Eremophila fraseri* subsp. *fraseri* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Low Shrubs of *Acacia catenulata* subsp. *occidentalis*.

**Veg Condition** Excellent.**Fire Age**        Moderate.

**Notes**            Aspect: N/A.  
 Bare Ground: 70%.  
 Litter Cover: 1% Logs, 2% Twigs, 2% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		2 m	OP25.07
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	1%		6 m	OP25.08
	<i>Acacia pruinocarpa</i>	2%		1.5 m	OP02.08
	<i>Acacia tetragonophylla</i>	+		1 m	OP25.02
	<i>Acacia tumida</i> var. <i>pilbarensis</i>	+		1 m	OP51.01 Flowering.
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		2.5 m	OP43.01
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+		0.5 m	OP43.04
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	1%		1 m	OP43.02 Flowering.
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		0.5 m	OP43.05
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		7 m	OP31.04
	<i>Psydrax latifolia</i>	+		1 m	OP25.01
	<i>Solanum lasiophyllum</i>	+		0.3 m	OP43.03
	<i>Triodia pungens</i>	1%		1 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	20%		0.3 m	OP02.14





*Triodia angusta*

2%

0.9 m OP44.03

**Ophthalmia**                      **Site**    OP45**Described by** CS    **Date** 16/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      730687    mE                      7421505    mN**Habitat**       Rocky gently undulating plain between two low hills.**Soil**            Red-brown sandy loam with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia bivenosa* and *Acacia kempeana* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica* and *Eucalyptus xerothermica* with Scattered Low Shrubs of *Senna stricta*.

**Veg Condition**    Excellent.**Fire Age**        Recent.

**Notes**            Aspect: N/A.  
 Bare Ground: 95%.  
 Litter Cover: 2% Logs, 5% Twigs, <1% Lvs.  
 Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>major</i>	+		2.5 m	OP45.03
	<i>Acacia bivenosa</i>	1%		1.5 m	OP03.01
	<i>Acacia kempeana</i>	1%		1 m	OP45.01
	<i>Acacia synchronicia</i>	+		0.3 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		2 m	OP03.11
	<i>Aristida contorta</i>	(+)		0.3 m	NC
	<i>Capparis lasiantha</i>	+		1 m	OP03.09
	<i>Eremophila cuneifolia</i>	+		0.6 m	OP11.10
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		1.5 m	OP45.05
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		1 m	OP47.02
	<i>Eucalyptus xerothermica</i>	+		2 m	OP09.03
	<i>Hakea preissii</i>	+		1 m	OP45.02
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.4 m	OP03.18
	<i>Maireana triptera</i>	+		0.4 m	OP45.04
	<i>Melaleuca eleuterostachya</i>	+		0.9 m	OP07.01
	<i>Paraneurachne muelleri</i>	(1%)		0.4 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Scaevola spinescens</i>	+		0.4 m	OP13.06
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP03.07
	<i>Senna stricta</i>	1%		0.2 m	OP03.13
	<i>Triodia brizoides</i>	5%		0.3 m	OP45.05

**Ophthalmia**                      **Site** OP46  
**Described by** CS                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50                      733639 **mE**                      7421770 **mN**

**Habitat** Low rocky hill with slight drainage depression.

**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and

*T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* and *Triodia melvillei* with Very Open Mallees of *Eucalyptus gamophylla* and *Eucalyptus socialis* subsp. *eucentrica* with Open Shrubland of *Acacia bivenosa* and *Acacia ancistrocarpa* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*.

**Veg Condition** Pristine.

**Fire Age** Young to Recent.

**Notes** Aspect: North.  
 Bare Ground: 75%.  
 Litter Cover: <1% Logs, 1% Twigs, <1% Lvs.  
 Disturbance: Fire.



#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	1%		0.6 m	OP11.02
	<i>Acacia bivenosa</i>	1%		1.5 m	OP03.01
	<i>Acacia kempeana</i>	+		0.6 m	OP11.06
	<i>Acacia pruinocarpa</i>	+		2 m	OP05.09
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Amphipogon sericeus</i>	+		0.3 m	OP46.03
	<i>Aristida contorta</i>	(+)		0.3 m	NC
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.5 m	OP13.02
	<i>Eucalyptus gamophylla</i>	2%		1.5 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		4 m	OP11.08
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	+		4 m	OP47.02
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		0.3 m	OP46.01
	<i>Goodenia stobbsiana</i>	(+)		0.3 m	NC
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		1 m	OP23.02
	<i>Hakea preissii</i>	+		0.5 m	OP45.02
	<i>Keraudrenia nephrosperma</i>	+		0.3 m	OP22.14
	<i>Paraneurachne muelleri</i>	+		0.4 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		1 m	OP03.08

<i>Ptilotus calostachyus</i>	+	0.4 m	OP46.02
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	NC
<i>Sida arenicola</i>	+	0.2 m	OP46.04
<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06
<i>Triodia melvillei</i>	1%	0.4 m	OP01.11
<i>Triodia wiseana</i>	25%	0.3 m	OP21.01

**Ophthalmia** Site OP47**Described by**CS **Date** 17/05/2010 **Type** Q

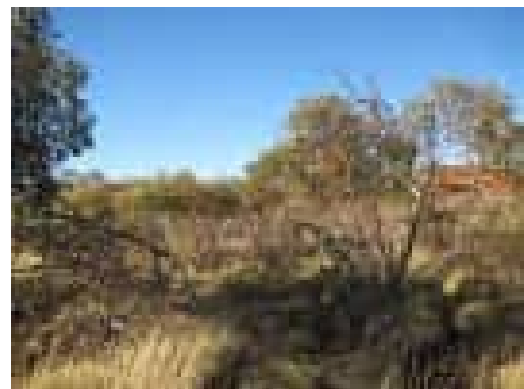
50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 731164 mE 7421608 mN**Habitat** Recky drainage depression between low hills.**Soil** Red-brown clay loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone, quartz and calcrete.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia pungens* with Open Shrubland of *Acacia kempeana* with Very Open Mallees of *Eucalyptus repullulans* and *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: N/A.  
 Bare Ground: 60%.  
 Litter Cover: 1% Logs, 2% Twigs, 1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11
	<i>Acacia aneura</i> var. <i>microcarpa</i>	+		1 m	OP47.03
	<i>Acacia bivenosa</i>	+		2 m	OP03.01
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1.5 m	OP01.14
	<i>Acacia kempeana</i>	5%		1.5 m	OP11.06
	<i>Acacia maitlandii</i>	+		1.5 m	OP22.13
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Capparis lasiantha</i>	+		0.5 m	OP03.09
	<i>Eucalyptus repullulans</i>	3%		3 m	OP47.01
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	2%		3 m	OP47.02
	<i>Maireana triptera</i>	+		0.4 m	OP45.04
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.5 m	OP03.07
	<i>Triodia pungens</i>	40%		0.5 m	

**Ophthalmia**                      **Site**    OP48  
**Described by**CS                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.  
**MGA Zone**    50            733983 **mE**            7422341 **mN**  
**Habitat**        Rocky hill top/ Plateau.  
**Soil**             Red-brown loam with cobbles and pebbles scattered on the soil surface.  
**Rock Type**    Ironstone and quartz.  
**Vegetation**    Broad Floristic Formation: *Triodia* Open Hummock Grassland



Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: High Shrubland of *Acacia aneura* var. *microcarpa*, *Acacia distans*, *Acacia aneura* var. *intermedia*, *Acacia pruinocarpa* and *Acacia aneura* var. *major* with Low Open Shrubland of *Eremophila forrestii* subsp. *forrestii* and *Acacia tetragonophylla* with Very Open Hummock Grassland of *Triodia melvillei*.

**Veg Condition**    Excellent.

**Fire Age**            Old.

**Notes**              Aspect: N/A.  
                           Bare Ground: 85%.  
                           Litter Cover: 1% Logs, 3% Twigs, 15% Lvs.  
                           Disturbance: Old track nearby..

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>intermedia</i>	2%		3.5 m	OP41.08
	<i>Acacia aneura</i> var. <i>major</i>	1%		2 m	OP45.03
	<i>Acacia aneura</i> var. <i>microcarpa</i>	10%		4 m	OP36.04
	<i>Acacia distans</i>	5%		4 m	OP36.02
	<i>Acacia pruinocarpa</i>	2%		3 m	OP05.09
	<i>Acacia synchronicia</i>	+		1.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	1%		1 m	OP03.11
	<i>Capparis lasiantha</i>	+		1.5 m	OP03.09
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	5%		1 m	OP36.01
	<i>Grevillea berryana</i>	+		1.5 m	OP01.13
	<i>Psyrax latifolia</i>	+		2 m	OP10.12
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.6 m	OP03.08
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.5-2 m	OP05.08
	<i>Triodia melvillei</i>	5%		0.3 m	OP01.11

**Ophthalmia**                      **Site**    OP49**Described by**CS    **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      730638    mE                      7423083    mN**Habitat**        Low hill slope.**Soil**             Red-brown sandy loam with cobbles and pebbles scattered on the soil surface. Some scattered boulders.**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia inaequilatera*, *Acacia pruinocarpa* and *Acacia kempeana* with Scattered Low Shrubs of *Ptilotus astrolasius* var. *astrolasius* with Scattered Tussock Grasses of *Paraneurachne muelleri*.

**Veg Condition**    Excellent.**Fire Age**         Moderate.

**Notes**            Aspect: North.  
 Bare Ground: 90%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: Horses and nearby road.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia inaequilatera</i>	2%		2.5 m	OP49.03
	<i>Acacia kempeana</i>	+		1 m	OP11.06
	<i>Acacia pruinocarpa</i>	1%		1.5 m	OP05.09
	<i>Acacia synchronicia</i>	+		1.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Aristida contorta</i>	(+)		0.2 m	NC
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.5 m	OP49.04
	<i>Cucumis maderaspatanus</i>	+		CR	OP35.02
	<i>Cymbopogon obtectus</i>	(+)		0.5 m	OP23.03
	<i>Enneapogon caeruleus</i>	+		0.2 m	OP49.06
	<i>Eremophila longifolia</i>	+		2 m	OP09.02
	<i>Eriachne tenuiculmis</i>	+		0.4 m	OP11.05
	<i>Eucalyptus repullulans</i>	+		0.9 m	OP47.01
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	+		0.2 m	OP49.05
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		3 m	OP23.02
	<i>Hibiscus haynaldii</i>	+		0.3 m	OP21.02
	<i>Hibiscus sturtii</i> var. ? <i>campylochlamys</i>	+		0.7 m	OP21.05
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.5 m	OP09.07
	<i>Paraneurachne muelleri</i>	1%		0.4 m	OP23.04
	<i>Peripleura arida</i>	(+)		0.3 m	OP49.02
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	1%		0.5 m	OP03.08

<i>Ptilotus exaltatus</i>	(+)	0.4 m	NC	
<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+	0.4 m	OP21.06	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+	0.6 m	OP21.04	
<i>Solanum horridum</i>	+	0.2 m	OP03.14	
<i>Solanum lasiophyllum</i>	+	0.4 m	OP19.06	
<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	+	0.7 m	OP49.01	plus sida sp. Excedentifolia
<i>Themeda triandra</i>	+	0.6 m	OP15.16	
<i>Triodia wiseana</i>	10%	0.4 m	OP21.01	



Ophthalmia Site OP50

Described by CS Date 17/05/2010 Type Q 100 x 25 m

Location Ophthalmia.

MGA Zone 50 734512 mE 7423037 mN

Habitat Drainage line.

Soil Deep pebbles.

Rock Type Ironstone and dolerite.

Vegetation Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Open Shrubland of *Acacia citrinoviridis* and *Petalostylis labicheoides* with Very Open Tussock Grassland of *Paraneurachne muelleri*, *Eulalia aurea* and *Themeda triandra* with Low Open Woodland of *Eucalyptus victrix* with Low Open Shrubland of *Rulingia luteiflora* and *Eremophila longifolia* with Scattered Low Shrubs of *Tephrosia rosea* var. *glabrior*.

Veg Condition Excellent to Very Good.

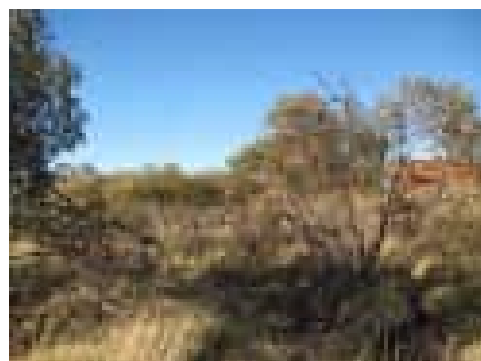
Fire Age Old.

Notes Aspect: N/A.

Bare Ground: 85%.

Litter Cover: 1% Logs, 5% Twigs, 10% Lvs.

Disturbance: Horses, cattle and introduced species.



## SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.5 m	OP11.11
	<i>Acacia citrinoviridis</i>	6%		2-3 m	OP01.05
	<i>Acacia maitlandii</i>	+		1 m	OP22.13
	<i>Acacia pyrifolia</i>	+		1 m	NC
	<i>Bidens bipinnata</i>	+		0.2 m	OP09.19
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.2 m	OP29.01
	<i>Chrysopogon fallax</i>	(+)		0.3 m	NC
	<i>Cleome viscosa</i>	+		0.1 m	NC
	<i>Cucumis maderaspatanus</i>	+		CR	OP35.02
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.2 m	OP15.02
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila longifolia</i>	1%		1.5 m	OP09.02
	<i>Eucalyptus victrix</i>	3%		8 m	OP29.04
	<i>Eulalia aurea</i>	1%		0.5 m	OP09.09
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	+		CR	OP15.06
	<i>Glycine canescens</i>	+		CR	OP50.04
	<i>Goodenia lamprosperma</i>	+		0.4 m	OP50.01
	<i>Gossypium sturtianum</i>	+		1 m	OP09.11
	<i>Indigofera georgei</i>	+		0.4 m	OP29.02

<i>Ipomoea muelleri</i>	+	CR	OP37.01	
<i>Isotropis forrestii</i>	+	0.4 m	OP29.03	
<i>Paraneurachne muelleri</i>	5%	0.4 m	OP35.07	Flowering.
<i>Petalostylis labicheoides</i>	3%	2 m	OP12.01	
<i>Phyllanthus maderaspatensis</i>	+	0.3 m	OP37.03	
<i>Rhagodia eremaea</i>	+	1 m	OP13.05	
<i>Rulingia luteiflora</i>	1%	1.5 m	OP03.06	
<i>Tephrosia rosea</i> var. <i>glabrior</i>	1%	0.4 m	OP50.02	
<i>Themeda triandra</i>	1%	0.4 m	OP15.16	
<i>Vigna lanceolata</i> var. <i>lanceolata</i>	+	CR	OP50.03	

**Ophthalmia**                      **Site**    OP51  
**Described by** CH                                      **Date** 17/05/2010 **Type** Q

120 x 15 m

**Location**    Ophthalmia.

**MGA Zone**    50            734344 **mE**            7421603 **mN**

**Habitat**        Drainage line.

**Soil**             Red-brown silty loam.

**Rock Type**

**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Tussock Grassland of *Themeda triandra* with Shrubland of *Gossypium sturtianum*, *Acacia maitlandii*, *Petalostylis labicheoides*, *Acacia bivenosa* and *Rulingia luteiflora* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition**    Excellent.

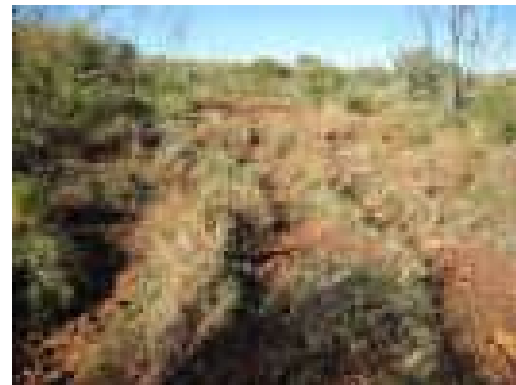
**Fire Age**         Moderate.

**Notes**            Aspect: N/A.

Bare Ground: 40%.

Litter Cover: <1% Logs, 2% Twigs, 10% Lvs.

Disturbance: Horses.



#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	1%		1.5 m	OP27.03
	<i>Acacia maitlandii</i>	5%		1.2 m	OP51.03
	<i>Acacia tetragonophylla</i>	+		0.3 m	OP51.04
	<i>Acacia tumida</i> var. <i>pilbarensis</i>	+		1 m	OP51.01
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		0.8 m	OP08.07
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	12%		3 m	OP27.02
	<i>Gossypium sturtianum</i>	10%		1.5 m	OP51.02
	<i>Petalostylis labicheoides</i>	2%		1.3 m	OP04.17
	<i>Rulingia luteiflora</i>	1%		1.3 m	OP02.16
	<i>Themeda triandra</i>	20%		0.5 m	OP04.18 Flowering.
	<i>Triodia pungens</i>	+		0.5 m	OP33.01 Flowering.

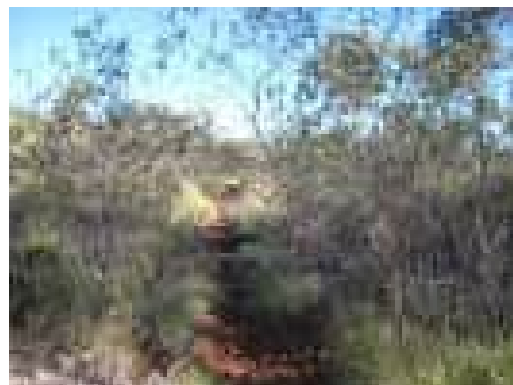
**Ophthalmia** Site OP52**Described by CS** Date 17/05/2010 Type Q

100 x 25 m

**Location** Ophthalmia.**MGA Zone** 50 734837 mE 7423466 mN**Habitat** Drainage line.**Soil** Red-brown clayey loam with cobbles, pebbles and boulders.**Rock Type** Ironstone and calcrete.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Hummock Grassland of *Triodia pungens* and *Triodia wiseana* with Shrubland of *Dodonaea lanceolata* var. *lanceolata*, *Acacia pachyacra*, *Acacia ancistrocarpa* and *Acacia maitlandii* with High Shrubland of *Acacia monticola*, *Acacia bivenosa* and *Petalostylis labicheoides* with Open Tussock Grassland of *Paraneurachne muelleri*, *Themeda triandra* and *Eulalia aurea* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Eucalyptus xerothermica* with Scattered Mallees of *Eucalyptus gamophylla* with Scattered Low Shrubs of *Goodenia microptera*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: N/A.  
Bare Ground: 50%.  
Litter Cover: 10% Logs, 5% Twigs, 5% Lvs.  
Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		0.5 m	OP52.05	Flowering.
	<i>Acacia ancistrocarpa</i>	6%		1.5 m	OP52.02	Flowering.
	<i>Acacia bivenosa</i>	5%		2.5 m	OP03.01	
	<i>Acacia dictyophleba</i>	+		1.5-2 m	OP09.10	
	<i>Acacia maitlandii</i>	1%		2 m	OP22.13	
	<i>Acacia monticola</i>	10%		2.5 m	OP52.03	
	<i>Acacia pachyacra</i>	7%		2 m	OP23.01	
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01	
	<i>Acacia tetragonophylla</i>	+		2 m	OP03.11	
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.4 m	OP49.04	
	<i>Corymbia hamersleyana</i>	1%		6 m	OP11.09	
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	10%		2 m	OP44.02	
	<i>Eremophila longifolia</i>	+		1 m	OP09.02	
	<i>Eucalyptus gamophylla</i>	1%		4 m	NC	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		5 m	OP11.08	

<i>Eucalyptus xerothermica</i>	1%	5 m	OP09.03	
<i>Eulalia aurea</i>	2%	0.3 m	OP09.09	
<i>Goodenia microptera</i>	1%	0.4 m	OP52.04	
<i>Hakea lorea</i> subsp. <i>lorea</i>	+	1.5 m	OP10.38	
<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CL	OP09.07	
<i>Paraneurachne muelleri</i>	5%	0.4 m	OP35.07	Flowering.
<i>Petalostylis labicheoides</i>	1%	2.5 m	OP12.01	
<i>Santalum lanceolatum</i>	+	1.5 m	OP41.05	
<i>Themeda triandra</i>	5%	0.4 m	OP15.16	
<i>Triodia pungens</i>	40%	0.5 m	OP52.01	Flowering.
<i>Triodia wiseana</i>	2%	0.4 m	OP21.01	

**Ophthalmia**                      **Site**    OP53  
**Described by** CH                                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

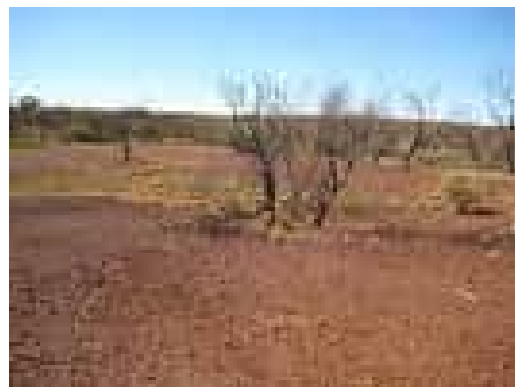
**MGA Zone**    50                      733860 **mE**                      7420940 **mN**

**Habitat**       Gently undulating plain.

**Soil**            Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp.  
 Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia catenulata* subsp. *occidentalis*, *Acacia bivenosa* and *Psydrax latifolia*.



**Veg Condition** Excellent.

**Fire Age**        Young.

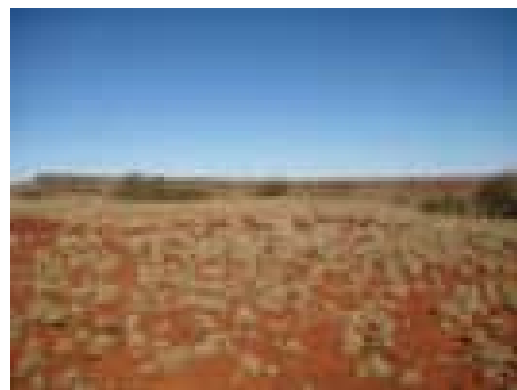
**Notes**            Aspect: East.  
 Bare Ground: 75%.  
 Litter Cover: 5% Logs, 5% Twigs, 1% Lvs.  
 Disturbance: Fire.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	1%		1 m	OP27.03 Flowering.
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	5%		2 m	OP25.08
	<i>Acacia pruinocarpa</i>	+		1 m	OP02.08
	<i>Codonocarpus cotinifolius</i>	+		1 m	OP53.01
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.5 m	OP39.01
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		0.5 m	OP25.11
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		8 m	OP31.04
	<i>Goodenia stobbsiana</i>	+		0.5 m	OP53.03
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		0.5 m	OP53.02
	<i>Psydrax latifolia</i>	1%		1 m	OP25.01
	<i>Ptilotus calostachyus</i>	+		0.7 m	OP02.07
	<i>Rulingia luteiflora</i>	+		0.6 m	OP02.16
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1 m	OP33.02
	<i>Solanum lasiophyllum</i>	+		0.4 m	OP43.03
	<i>Triodia pungens</i>	5%		0.3 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	15%		0.2 m	OP02.14

**Ophthalmia**                      **Site**    OP54**Described by** EC    **Date** 17/05/2010 **Type** Q    50 x 50 m**Location**    Ophthalmia.**MGA Zone**    50                      735696 **mE**                      7423707 **mN****Habitat**        Low hilltop with breakaway edges.**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone and dolerite.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronica*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia* aff. *basedowii* with Scattered Low Shrubs of *Senna glutinosa* subsp. *pruinosa*, *Senna glutinosa* subsp. *pruinosa*, *Ptilotus astrolasius* var. *astrolasius*, *Acacia pruinocarpa* and *Acacia tetragonophylla*.

**Veg Condition** Pristine.**Fire Age**        Young.

**Notes**            Aspect: N/A.  
 Bare Ground: 70%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

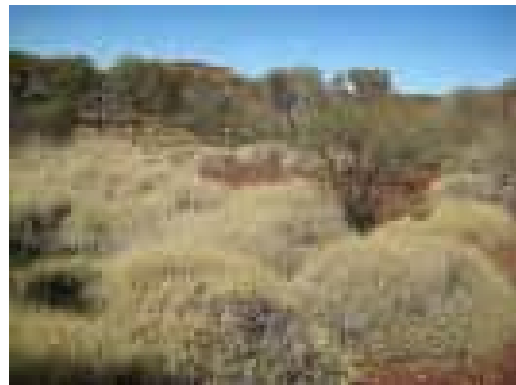
Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		0.5 m	OP03.16
	<i>Acacia aneura</i> var. <i>microcarpa</i>			3-4 m	OP01.07 Associated (growing on the breakaway).
	<i>Acacia citrinoviridis</i>			3-4 m	OP01.05 Associated (growing on the breakaway).
	<i>Acacia inaequilatera</i>	+		1 m	OP49.03
	<i>Acacia pruinocarpa</i>	+		1-3 m	OP05.09
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	(+)		0.2 m	OP54.02
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		0.4 m	OP54.03
	<i>Goodenia triodiophila</i>	+		0.2 m	OP54.04
	<i>Grevillea berryana</i>			1.2 m	OP01.13 Associated (growing on the breakaway).
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP03.08
	<i>Ptilotus calostachyus</i>	+		0.3 m	NC
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.6 m	OP42.03
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		0.5 m	OP28.01
	<i>Sida arenicola</i>	+		0.4 m	OP42.04
	<i>Triodia</i> aff. <i>basedowii</i>	25%		0.2 m	OP54.01

**Ophthalmia** Site OP55**Described by** CH **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 734700 mE 7420900 mN**Habitat** Undulating plain.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp.  
 Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens* and *Triodia angusta* with High Shrubland of *Acacia aneura* var. *aneura*, *Acacia aneura* var. *microcarpa* and *Acacia catenulata* subsp. *occidentalis* with Open Shrubland of *Acacia tetragonophylla* with Scattered Mallees of *Eucalyptus trivalva*.

**Veg Condition** Pristine.**Fire Age** Very Old.

**Notes** Aspect: East.  
 Bare Ground: 50%.  
 Litter Cover: 2% Logs, 4% Twigs, 4% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	10%		5 m	OP25.07
	<i>Acacia aneura</i> var. <i>microcarpa</i>	2%		4 m	OP55.05
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	1%		3 m	OP25.08
	<i>Acacia pruinocarpa</i>	+		3 m	OP02.08
	<i>Acacia sibilans</i>	+		1 m	OP55.07
	<i>Acacia tetragonophylla</i>	5%		1.5 m	OP25.02
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	+		1.5 m	OP55.01
	<i>Eucalyptus trivalva</i>	1%		4 m	OP55.03
	<i>Maireana triptera</i>	+		0.3 m	OP25.10
	<i>Ptilotus exaltatus</i>	+		1 m	OP04.15
	<i>Rulingia luteiflora</i>	+		1.2 m	OP02.16
	<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+		0.2 m	OP04.05
	<i>Scaevola spinescens</i>	+		0.5 m	OP55.02
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1 m	OP33.02
	<i>Senna stricta</i>	+		0.5 m	OP55.04
	<i>Triodia angusta</i>	5%		0.8 m	OP55.06
	<i>Triodia pungens</i>	25%		0.4 m	OP33.01



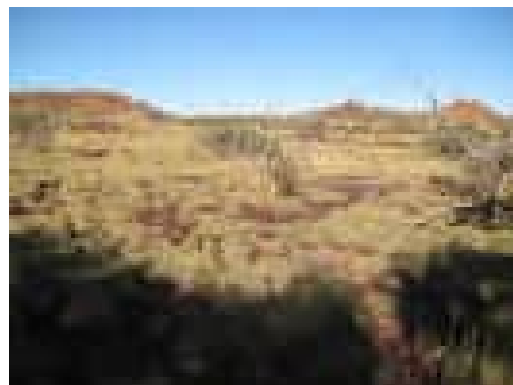


**Ophthalmia** Site OP56B**Described by** CS **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 736650 mE 7422393 mN**Habitat** Rocky undulating plain**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronica*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Very Open Mallees of *Eucalyptus repullulans* and *Eucalyptus socialis* subsp. *eucentrica* with Scattered Shrubs of *Acacia synchronica*, *Acacia kempeana*, *Acacia bivenosa*, *Acacia ancistrocarpa*, *Acacia pruinocarpa* and *Acacia tetragonophylla*.

**Veg Condition** Excellent.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 55%.

Litter Cover: 2% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: Fire.

Notes: Patchy burn through site.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		0.5 m	OP11.02
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.5 m	OP11.11
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01
	<i>Acacia kempeana</i>	+		0.9 m	OP11.06
	<i>Acacia pruinocarpa</i>	+		1.2 m	OP05.09
	<i>Acacia synchronica</i>	1%		0.5-2 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Capparis lasiantha</i>	+		1 m	OP03.09
	<i>Codonocarpus cotinifolius</i>	+		0.3 m	OP17.06
	<i>Eremophila longifolia</i>	+		1 m	OP09.02
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		1 m	OP56.01b
	<i>Eucalyptus repullulans</i>	5%		2 m	OP47.01
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		2 m	OP47.02
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07
	<i>Maireana triptera</i>	+		0.3 m	OP45.04
	<i>Petalostylis labicheoides</i>	+		1.5 m	OP12.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.2 m	OP03.07
	<i>Triodia wiseana</i>	45%		0.5 m	OP21.01

**Ophthalmia**                      **Site**    OP57  
**Described by** BW                                      **Date** 17/05/2010 **Type** Q

**Location**    Ophthalmia.

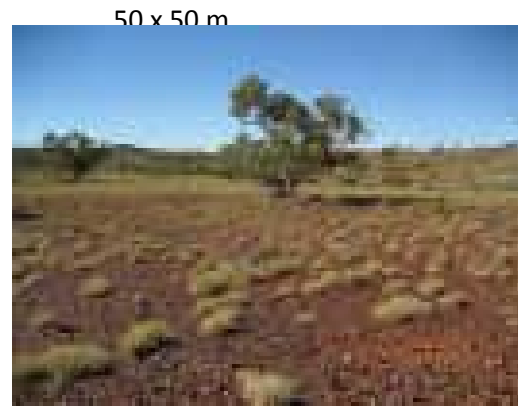
**MGA Zone**    50                      735083    **mE**                      7421532    **mN**

**Habitat**        Mid-slope of low hill.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia brizoides* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Low Shrubs of *Acacia bivenosa*.



**Veg Condition**    Excellent.

**Fire Age**        Young to Moderate.

**Notes**            Aspect: N/A.  
 Topography: Sloping.  
 Bare Ground: 80%.  
 Litter Cover: <1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		0.6 m	OP27.03
	<i>Acacia synchronicia</i>	+		0.2 m	OP57.05
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	4%		8-9 m	OP57.06
	<i>Melaleuca eleuterostachya</i>	+		0.7 m	OP57.02
	<i>Ptilotus exaltatus</i>	+		0.2 m	OP04.15
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		0.8 m	OP57.04
	<i>Themeda triandra</i>	+		0.4 m	OP57.03
	<i>Triodia brizoides</i>	20%		0.2 m	OP57.01





<i>Keraudrenia nephrosperma</i>	+	0.2 m	OP02.01
<i>Malvastrum americanum</i>	+	0.2 m	OP59.11
<i>Marsilea hirsuta</i>	+	<0.1 m	OP59.12
<i>Petalostylis labicheoides</i>	8%	2-3 m	OP04.17
<i>Pluchea dentex</i>	+	0.3 m	OP59.17
<i>Pluchea</i> sp.	+	<0.1 m	OP59.13
<i>Rulingia luteiflora</i>	+	0.8 m	OP02.16
<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+	0.9 m	OP59.01
<i>Tephrosia rosea</i> var. <i>glabrior</i>	+	0.3 m	OP59.14
<i>Themeda triandra</i>	15%	0.6 m	OP59.25
<i>Triodia pungens</i>	1%	0.4 m	OP59.20

**Ophthalmia** Site OP60**Described by** EC **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmima.**MGA Zone** 50 739230 mE 7424160 mN**Habitat** Low hilltop/ scree slope.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*

sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia melvillei* with Low Open Shrubland of *Acacia aneura* var. *intermedia*, *Acacia ancistrocarpa* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola*.

**Veg Condition** Pristine.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: Track 200 m from site.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia adsurgens</i>	+		1 m	OP60.06	
	<i>Acacia ancistrocarpa</i>	2%		1-2 m	OP11.02	
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.5-1.5 m	OP11.11	
	<i>Acacia aneura</i> var. <i>intermedia</i>	2%		0.5-1.2 m	OP60.02	
	<i>Acacia kempeana</i>	+		0.8-1.5 m	OP60.04	Flowering.
	<i>Acacia pruinocarpa</i>	+		2.5 m	OP05.09	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		4-6 m	OP05.01	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		0.8 m	OP60.05	
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	+		1 m	OP60.03	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.6 m	OP03.18	
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP60.07	
	<i>Psydrax suaveolens</i>	+		1 m	OP10.06	
	<i>Rulingia luteiflora</i>	+		1.5 m	OP03.06	
	<i>Santalum lanceolatum</i>	+		2 m	OP22.16	
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		2 m	OP42.03	
	<i>Triodia melvillei</i>	2%		0.3 m	OP16.07	
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	30%		0.3 m	OP60.01	

**Ophthalmia**                      **Site**    OP61  
**Described by** CH                                      **Date** 17/05/2010 **Type** Q

30 x 85 m

**Location**    Ophthalmia.

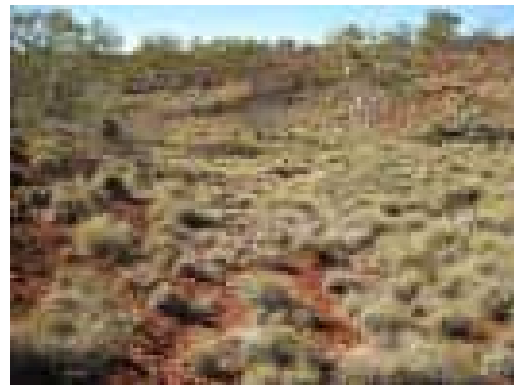
**MGA Zone**    50                      733613    mE                      7421580    mN

**Habitat**        Minor gully between low hills.

**Soil**              Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone and quartz.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Hummock Grassland of *Triodia pungens* with Low Woodland over *Eucalyptus leucophloia* subsp. *leucophloia*.



**Veg Condition**    Pristine.

**Fire Age**         Moderate to Young.

**Notes**            Aspect: N/A.  
 Bare Ground: 30%.  
 Litter Cover: 1% Logs, 1% Twigs, 3% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	1%		3 m	OP25.08
	<i>Acacia pruinocarpa</i>	+		2.5 m	OP02.08
	<i>Acacia tetragonophylla</i>	1%		1.5 m	OP25.02
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		1 m	OP25.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	20%		8 m	OP31.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		1 m	OP71.03
	<i>Triodia pungens</i>	60%		0.4 m	OP33.01
	<i>Triodia wiseana</i>	+		0.3 m	OP25.04





<i>Triodia melvillei</i>	10%	0.3 m	OP16.07
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	3%	0.3 m	OP26.11

**Ophthalmia**                      **Site**    OP63  
**Described by** BW                                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      735424 **mE**                      7422510 **mN**

**Habitat**        Mid-slope of gently sloping hill.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Open Hummock Grassland of *Triodia brizoides* and *Triodia pungens* with Low Open Shrubland of *Acacia ancistrocarpa* and *Acacia bivenosa* with Very Open Mallees of *Eucalyptus gamophylla* with Scattered Trees of *Eucalyptus leucophloia* subsp. *leucophloia*.

**Veg Condition**    Excellent.

**Fire Age**         Young to Moderate.

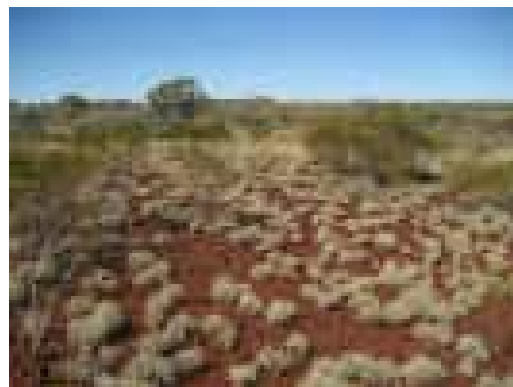
**Notes**            Aspect: N/A.

Topography: Sloping.

Bare Ground: 75%.

Litter Cover: <1% Logs, 2% Twigs, 2% Lvs.

Disturbance: Old drill pad nearby.



#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	3%		<1 m	OP63.01
	<i>Acacia bivenosa</i>	1%		0.8 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1.5 m	OP63.05
	<i>Acacia pruinocarpa</i>	+		0.7 m	OP02.08
	<i>Acacia synchronicia</i>	+		0.4 m	OP57.05
	<i>Acacia tenuissima</i>	+		1.2 m	OP63.03
	<i>Anthobolus leptomerioides</i>	+		0.8 m	OP63.06
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus gamophylla</i>	3%		1.5-3 m	OP02.21
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		11 m	OP57.06
	<i>Hakea chordophylla</i>	+		0.6 m	NC
	<i>Ptilotus exaltatus</i>	+		0.8 m	OP04.15
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.8 m	OP63.02
	<i>Triodia brizoides</i>	15%		0.3 m	OP57.01
	<i>Triodia pungens</i>	2%		0.4 m	OP63.04

**Ophthalmia** Site OP64

**Described by** CS **Date** 18/05/2010 **Type** Q 50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50 739172 mE 7423640 mN

**Habitat** Low rocky hill.

**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*

*wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Hummock Grassland of *Triodia brizoides* and *Triodia pungens* with Open Shrubland of *Acacia ancistrocarpa* and *Acacia atkinsiana* with Very Open Mallees of *Eucalyptus gamophylla* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola* and *Eucalyptus xerothermica*.



**Veg Condition** Pristine.

**Fire Age** Old.

**Notes** Aspect: N/A.

Bare Ground: 55%.

Litter Cover: 1% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	5%		2 m	OP11.02	Flowering.
	<i>Acacia atkinsiana</i>	1%		1 m	OP64.02	
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1 m	OP01.14	
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		4 m	OP05.01	
	<i>Cymbopogon obtectus</i>	+		0.6 m	OP23.03	
	<i>Digitaria brownii</i>	+		0.3 m	OP64.04	
	<i>Duperreya commixta</i>	+		CR	OP03.05	
	<i>Eucalyptus gamophylla</i>	2%		3 m	NC	
	<i>Eucalyptus xerothermica</i>	+		4 m	OP09.03	
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		3 m	OP23.02	
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CR	OP09.07	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		1 m	OP03.08	
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP01.08	
	<i>Solanum centrale</i>	+		0.4 m	OP64.03	
	<i>Triodia brizoides</i>	40%		0.3 m	OP64.01	
	<i>Triodia pungens</i>	5%		0.4 m	OP52.01	

**Ophthalmia** Site OP65**Described by** CH **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 735440 mE 7423000 mN**Habitat** Low undulating hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Dolerite.**Vegetation** Broad Floristic Formation: *Triodia* Hummock GrasslandVegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia**synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia sibilans* and *Acacia pruinocarpa* with Scattered Hummock Grasses of *Triodia pungens* with Scattered Low Shrubs of *Acacia synchronicia*.**Veg Condition** Pristine.**Fire Age** Young to Moderate.**Notes** Aspect: N/A.

Bare Ground: 50%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		1 m	OP08.01
	<i>Acacia pruinocarpa</i>	1%		1 m	OP02.08
	<i>Acacia sibilans</i>	2%		1.5 m	OP55.07
	<i>Acacia synchronicia</i>	1%		0.5 m	OP27.05
	<i>Acacia tetragonophylla</i>	+		1 m	OP25.02
	<i>Anthobolus leptomerioides</i>	+		0.6 m	OP31.02
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.4 m	OP02.12
	<i>Solanum lasiophyllum</i>	+		0.3 m	OP43.03
	<i>Triodia pungens</i>	1%		0.5 m	OP33.01 Flowering.
	<i>Triodia wiseana</i>	50%		0.2 m	OP25.04

**Ophthalmia** Site OP66**Described by** CS **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 739719 mE 7423483 mN**Habitat** Low undulating hilltop.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia brizoides* and *Triodia pungens* with Open Shrubland of *Acacia atkinsiana* and *Acacia ancistrocarpa* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* with Scattered Low Shrubs of *Rulingia loxophylla* with Scattered Mallees of *Eucalyptus gamophylla*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 45%.

Litter Cover: 2% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

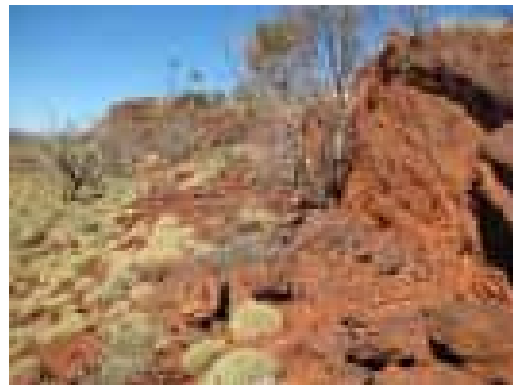
**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	(+)		0.4 m	OP52.05
	<i>Acacia</i> aff. <i>adsurgens</i>	+		1.5 m	OP09.01
	<i>Acacia ancistrocarpa</i>	2%		2 m	OP11.02 Flowering.
	<i>Acacia atkinsiana</i>	5%		2 m	OP64.02
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia elachantha</i>	+		2 m	OP66.02
	<i>Acacia tumida</i> var. <i>pilbarensis</i>	+		2 m	NC
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	3%		4 m	OP05.01
	<i>Cymbopogon obtectus</i>	+		0.7 m	OP23.03
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila longifolia</i>	+		1.5 m	OP09.02
	<i>Eucalyptus gamophylla</i>	1%		3 m	NC
	<i>Eucalyptus xerothermica</i>				NC Within the same vegetation association (out of plot).
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2 m	OP23.02
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CR	OP09.07
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18
	<i>Paraneurachne muelleri</i>	(+)		0.4 m	OP23.04

<i>Psyrax latifolia</i>	+	0.9 m	OP10.12
<i>Rulingia loxophylla</i>	1%	0.4 m	OP66.01 Flowering.
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+	1 m	OP78.03
<i>Solanum lasiophyllum</i>	+	1 m	OP19.06
<i>Themeda triandra</i>	+	0.5 m	OP15.16
<i>Triodia brizoides</i>	50%	0.3 m	OP64.01
<i>Triodia pungens</i>	2%	0.6 m	OP52.01 Flowering.

**Ophthalmia** Site OP67**Described by** CH **Date** 17/05/2010 **Type** Q

15 x 100 m

**Location** Ophthalmia.**MGA Zone** 50 737100 mE 7422730 mN**Habitat** Breakaway on the northern side of a ridge running East-West.**Soil** Red-brown skeletal loam with exposed bedrock.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland

Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Very Open Tussock Grassland of *Eriachne tenuiculmis* with High Open Shrubland of *Acacia catenulata* subsp. *occidentalis*, *Acacia citrinoviridis* and *Acacia aneura* var. *microcarpa*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: North.  
Bare Ground: 50%.  
Litter Cover: 3% Logs, 3% Twigs, 1% Lvs.  
Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>microcarpa</i>	1%		4 m	OP67.05
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	3%		5 m	OP25.08
	<i>Acacia citrinoviridis</i>	1%		5 m	OP67.02
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP02.08
	<i>Capparis lasiantha</i>	+		0.5 m	OP67.09
	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>	+		2 m	OP67.01
	<i>Codonocarpus cotinifolius</i>	+		2 m	OP02.13
	<i>Cymbopogon ambiguus</i>	+		0.7 m	OP67.03 Flowering.
	<i>Eremophila exilifolia</i>	+		0.4 m	OP67.06
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1 m	OP67.11
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	+		1 m	OP67.10
	<i>Eremophila longifolia</i>	+		1 m	OP04.16
	<i>Eriachne tenuiculmis</i>	10%		0.3 m	OP67.08 Flowering.
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		6 m	OP31.04
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.8 m	OP67.04
	<i>Psydrax latifolia</i>	+		1 m	OP25.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP67.07

<i>Tribulus suberosus</i>	+	0.5 m	OP25.05
<i>Triodia pungens</i>	20%	0.4 m	OP33.01
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	1%	0.3 m	OP02.14



**Ophthalmia** Site OP68**Described by**CS **Date** 18/05/2010 **Type** Q

100 x 25 m

**Location** Ophthalmia.**MGA Zone** 50 740212 mE 7423252 mN**Habitat** Minor drainage line.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies.Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens* with High Shrubland of *Acacia monticola* and *Petalostylis labicheoides* with Very Open Tussock Grassland of *Themeda triandra* and *Paraneurachne muelleri* with Open Shrubland of *Acacia ancistrocarpa*, *Acacia bivenosa* and *Santalum lanceolatum* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia*.**Veg Condition** Pristine.**Fire Age** Old.

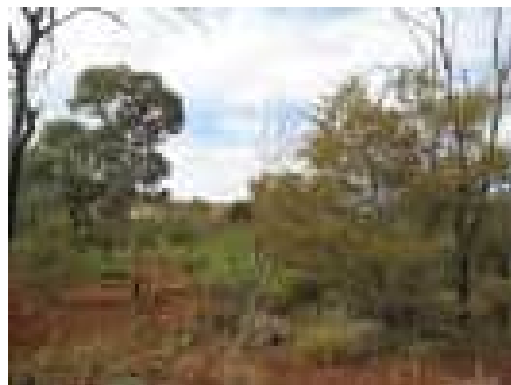
**Notes** Aspect: North.  
 Bare Ground: 80%.  
 Litter Cover: 1% Logs, 2% Twigs, 2% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	2%		1 m	OP11.02 Flowering.
	<i>Acacia bivenosa</i>	+		2 m	OP03.01
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1 m	OP01.14
	<i>Acacia kempeana</i>	+		1 m	OP11.06
	<i>Acacia monticola</i>	10%		2.5 m	OP52.03
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Corymbia hamersleyana</i>	1%		5 m	OP11.09
	<i>Cymbopogon ambiguus</i>	+		0.7 m	OP68.04
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		2 m	OP44.02
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.5 m	OP68.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		5 m	OP11.08
	<i>Gossypium robinsonii</i>	+		1-2 m	OP68.01
	<i>Hybanthus aurantiacus</i>	+		0.4 m	OP29.06
	<i>Keraudrenia nephrosperma</i>	+		0.4 m	OP22.14
	<i>Paraneurachne muelleri</i>	1%		0.4 m	OP35.07
	<i>Petalostylis labicheoides</i>	7%		2 m	OP12.01

<i>Rulingia luteiflora</i>	+	1.5 m	OP03.06	
<i>Santalum lanceolatum</i>	1%	1.5 m	OP41.05	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+	0.7 m	OP78.03	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1 m	OP01.08	
<i>Solanum horridum</i>	+	0.3 m	OP68.02	
<i>Themeda triandra</i>	5%	0.4 m	OP15.16	
<i>Triodia pungens</i>	20%	0.7 m	OP76.02	Flowering.



**Ophthalmia** Site OP70**Described by EC** Date 18/05/2010 **Type Q** 50 x 50 m**Location** Ophthalmia.**MGA Zone** 50 740834 mE 7422922 mN**Habitat** Floodplain.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Open Shrubland of *Acacia aneura* var. *aneura* and *Petalostylis labicheoides* with Low Open Woodland of *Eucalyptus xerothermica* with Low Open Shrubland of *Ptilotus astrolasius* var. *astrolasius* and *Cyperus bulbosus* with Very Open Hummock Grassland of *Themeda triandra*.

**Veg Condition** Good.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 75%.

Litter Cover: 3% Logs, 1% Twigs, 5% Lvs.

Disturbance: Heavily grazed and trampled by cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	5%		0.5-3 m	OP70.03	Flowering.
	<i>Acacia citrinoviridis</i>	+		2 m	OP01.05	
	<i>Bidens bipinnata</i>	+		0.1 m	OP09.19	
	<i>Chrysopogon fallax</i>	(5%)		0.4 m	NC	
	<i>Cucumis maderaspatanus</i>	+		CL	OP35.02	
	<i>Cyperus bulbosus</i>	1%		0.2 m	OP70.07	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.2 m	OP15.02	
	<i>Eremophila longifolia</i>	+		1 m	OP09.02	
	<i>Eucalyptus xerothermica</i>	3%		7 m	OP09.03	
	<i>Eulalia aurea</i>	(+)		0.2 m	OP09.09	
	<i>Euphorbia australis</i>	+		0.1 m	OP70.05	
	<i>Goodenia stellata</i>	+		0.1 m	OP15.12	
	<i>Indigofera georgei</i>	+		0.3 m	OP70.01	
	<i>Maireana villosa</i>	+		0.2 m	OP70.02	
	<i>Petalostylis labicheoides</i>	5%		1-2.5 m	OP12.01	
	<i>Polymeria ambigua</i>	+		0.1 m	OP70.04	
	<i>Pterocaulon sphaeranthoides</i>	+		0.2 m	OP12.03	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	1%		0.3-0.8 m	OP03.08	
	<i>Rhagodia eremaea</i>	+		1 m	OP13.05	
	<i>Salsola tragus</i>	+		0.3 m	NC	

<i>Santalum lanceolatum</i>	+	1 m	OP22.16
<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)	+	0.2 m	OP70.06 Flowering.
<i>Themeda triandra</i>	2%	0.2 m	OP15.16
<i>Triodia melvillei</i>	+	0.3 m	OP16.07

**Ophthalmia**                      **Site**    OP71**Described by** CH    **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      737740 mE                      7422900 mN**Habitat**       Gently undulating plain.**Soil**            Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia bivenosa* and *Senna artemisioides* subsp. *oligophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*.

**Veg Condition** Pristine.**Fire Age**        Young to Moderate.**Notes**            Aspect: N/A.

Bare Ground: 50%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	3%		1.5 m	OP27.03
	<i>Acacia pyrifolia</i>	+		1 m	OP71.02
	<i>Acacia synchronicia</i>	+		0.5 m	OP71.01
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		10 m	OP31.04
	<i>Maireana triptera</i>	+		0.2 m	OP25.10
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	1%		0.5 m	OP02.12
	<i>Triodia wiseana</i>	40%		0.2 m	OP25.04



**Ophthalmia**                      **Site** OP73  
**Described by** BW                      **Date** 17/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50                      737663 **mE**                      7422274 **mN**

**Habitat** Floodplain.

**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronica* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.

Vegetation Sub-Association: High Open Shrubs of *Acacia aneura* var. *intermedia* with High Open Shrubland of *Acacia tetragonophylla* and *Hakea preissii* with Very Open Hummock Grassland of *Triodia angusta* with Scattered Low Shrubs of *Scaevola spinescens*.

**Veg Condition** Excellent to Pristine.

**Fire Age** Moderate.

**Notes** Aspect: N/A.

Bare Ground: 90%.

Litter Cover: <1% Logs, 1% Twigs, 2% Lvs.

Disturbance: N/A.



#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>intermedia</i>	8%		4-5 m	OP73.04
	<i>Acacia tetragonophylla</i>	5%		1.5 m	NC
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		1 m	OP73.05
	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>	+		0.3 m	OP73.08
	<i>Eucalyptus trivalva</i>	+		3 m	OP73.06
	<i>Hakea preissii</i>	1%		1.7-3 m	OP73.03
	<i>Scaevola spinescens</i>	1%		0.6 m	OP73.01
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1 m	OP73.05a
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		3 m	OP57.04
	<i>Sida fibulifera</i>	+		0.1 m	OP73.07
	<i>Solanum lasiophyllum</i>	+		0.2 m	NC
	<i>Triodia angusta</i>	5%		0.4 m	OP73.09



**Ophthalmia**                      **Site**    OP74

**Described by** EC    **Date** 18/05/2010 **Type** Q    50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      741433 **mE**                      7422518 **mN**

**Habitat**        Low hill slope and undulating plain.

**Soil**             Salmon-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone and calcrete.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Low Open Shrubland of *Melaleuca eleuterostachya* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica*.



**Veg Condition**    Pristine.

**Fire Age**         Moderate.

**Notes**            Aspect: North-east.  
 Bare Ground: 65%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia synchronicia</i>	+		0.2 m	OP11.01
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		1 m	OP03.03
	<i>Melaleuca eleuterostachya</i>	4%		0.5-1 m	OP07.01
	<i>Triodia wiseana</i>	30%		0.3 m	OP82.01

**Ophthalmia**                      **Site**    OP75  
**Described by** CH                                      **Date** 18/05/2010 **Type** Q                                      50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      738130 **mE**                      7422120 **mN**

**Habitat**        Small steep hill.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone and quartz.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia*

*catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia wiseana* with High Open Shrubland of *Acacia citrinoviridis* with Low Open Shrubland of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Low Shrubs of *Eremophila latrobei* subsp. *glabra*.



**Veg Condition**    Excellent.

**Fire Age**        Young.

**Notes**            Aspect: North-east.  
 Bare Ground: 50%.  
 Litter Cover: <1% Logs, 5% Twigs, 1% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1 m	OP27.03
	<i>Acacia citrinoviridis</i>	3%		5 m	OP67.02
	<i>Acacia synchronicia</i>	+		1 m	OP11.01
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	1%		0.6 m	OP33.04
	<i>Eriachne tenuiculmis</i>	+		0.2 m	OP67.08 Flowering.
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		6 m	OP31.04
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.3 m	OP67.04 Flowering.
	<i>Maireana triptera</i>	+		0.2 m	OP25.10
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1 m	OP33.02
	<i>Triodia pungens</i>	25%		0.4 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	1%		0.2 m	OP02.14
	<i>Triodia wiseana</i>	1%		0.2 m	OP25.04

**Ophthalmia**                      **Site**    OP76**Described by** CS                                      **Date** 18/05/2010 **Type** Q                                      100 x 25 m**Location**    Ophthalmia.**MGA Zone**    50                      742340 mE                      7422662 mN**Habitat**        Drainage line.**Soil**             Red-brown clay loam on banks with deep pebbles in river bed.**Rock Type**    Ironstone, quartz and dolerite.**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Shrubland of *Petalostylis labicheoides*, *Acacia maitlandii*, *Eremophila longifolia*, *Gossypium sturtianum*, *Acacia dictyophleba*, *Rulingia luteiflora* and *Santalum lanceolatum* with Open Tussock Grassland of *Eulalia aurea*, *Themeda triandra* and *Chrysopogon fallax* with Open Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Acacia citrinoviridis* with Low Open Woodland of *Eucalyptus xerothermica* with Scattered Low Shrubs of *Dipteracanthus australasicus* subsp. *australasicus* with Scattered Herbs of *Bidens bipinnata*.

**Veg Condition**    Very Good.**Fire Age**        Old.**Notes**            Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 1% Logs, 2% Twigs, 5% Lvs.

Disturbance: Cattle and introduced species.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia</i> aff. <i>adsurgens</i>	+		1 m	OP76.03	Flowering. Inflorescence to open.
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11	
	<i>Acacia bivenosa</i>	+		2 m	OP03.01	
	<i>Acacia citrinoviridis</i>	5%		2.5 m	OP01.05	
	<i>Acacia dictyophleba</i>	1%		1.5 m	OP09.10	
	<i>Acacia maitlandii</i>	5%		2 m	OP22.13	
	<i>Bidens bipinnata</i>	1%		0.2 m	OP09.19	
	<i>Chrysocephalum apiculatum</i>	+		0.4 m	OP76.04	
	<i>Chrysopogon fallax</i>	1%		0.6 m	OP15.20	
	<i>Cleome viscosa</i>	+		0.2 m	NC	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	1%		0.2 m	OP15.02	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eremophila longifolia</i>	5%		1.5 m	OP09.02	Flowering.
	<i>Eucalyptus xerothermica</i>	3%		4 m	OP09.03	
	<i>Eulalia aurea</i>	10%		0.6 m	OP09.09	
	<i>Euphorbia</i> ? <i>coghlanii</i>	+		0.1 m	OP35.10	

<i>Gossypium sturtianum</i>	1%	1.5 m	OP09.11
<i>Hybanthus aurantiacus</i>	+	0.3 m	OP29.06
<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CL	OP09.07
<i>Paraneurachne muelleri</i>	+	0.4 m	OP23.04
<i>Petalostylis labicheoides</i>	10%	2 m	OP12.01 Flowering.
<i>Ptilotus obovatus</i>	+	0.5 m	OP15.08
<i>Rhyncharrhena linearis</i>	+	CR	OP15.10
<i>Rhynchosia minima</i>	+	CR	OP76.01
<i>Rulingia luteiflora</i>	1%	1 m	OP03.06
<i>Santalum lanceolatum</i>	1%	1.5 m	OP41.05
<i>Senna stricta</i>	+	1 m	OP03.13
<i>Themeda triandra</i>	5%	0.5 m	OP15.16
<i>Triodia pungens</i>	15%	0.5 m	OP76.02 Flowering.

**Ophthalmia**                      **Site**    OP77**Described by** BW    **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      738050 **mE**                      7422701 **mN****Habitat**        Low rise in undulating hills.**Soil**             Grey-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone and quartz.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp.*eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia**bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Open Hummock Grassland of *Triodia angusta* with Very Open Mallees of *Eucalyptus trivalva*.**Veg Condition**    Excellent to Pristine.**Fire Age**         Moderate.**Notes**            Aspect: N/A.

Bare Ground: 75%.

Litter Cover: &lt;1% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon cunninghamii</i>	+		0.3 m	OP77.03
	<i>Acacia bivenosa</i>	+		0.8 m	OP27.03
	<i>Acacia synchronicia</i>	+		0.2 m	OP57.05
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	+		0.3 m	OP77.06
	<i>Eremophila cuneifolia</i>	+		0.3 m	OP77.04
	<i>Eucalyptus gamophylla</i>	+		1.6 m	OP02.21
	<i>Eucalyptus trivalva</i>	6%		2-3 m	OP77.02
	<i>Melaleuca eleuterostachya</i>	+		0.8 m	OP77.01
	<i>Ptilotus exaltatus</i>	+		0.4 m	OP04.15
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP77.07
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.4 m	OP63.02
	<i>Solanum horridum</i>	+		0.2 m	OP77.09
	<i>Solanum lasiophyllum</i>	+		0.3 m	NC
	<i>Themeda triandra</i>	+		0.4 m	OP77.10
	<i>Triodia angusta</i>	20%		0.3 m	OP77.08

**Ophthalmia** Site OP78**Described by** CS **Date** 18/05/2010 **Type** Q 50 x 50 m**Location** Ophthalmia.**MGA Zone** 50 742725 mE 7422413 mN**Habitat** Low rolling rocky hill.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Dolerite and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia pungens* with Open Shrubland of *Acacia inaequilatera* and *Acacia ancistrocarpa* with Scattered Low Trees of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Mallees of *Eucalyptus gamophylla*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: South.  
Bare Ground: 60%.  
Litter Cover: <1% Logs, 1% Twigs, <1% Lvs.  
Disturbance: N/A.**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	1%		1.5 m	OP11.02	
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01	
	<i>Acacia dictyophleba</i>	+		1.5 m	OP09.10	
	<i>Acacia inaequilatera</i>	3%		2 m	OP49.03	
	<i>Acacia kempeana</i>	+		1 m	OP11.06	
	<i>Acacia maitlandii</i>	+		2 m	OP22.13	
	<i>Acacia pachyacra</i>	+		1 m	OP23.01	
	<i>Acacia synchronicia</i>	+		2 m	OP11.01	
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.5 m	OP78.05	
	<i>Corymbia hamersleyana</i>	1%		3-4 m	OP11.09	
	<i>Cymbopogon obtectus</i>	+		0.7 m	OP23.03	
	<i>Eremophila longifolia</i>	+		1 m	OP09.02	
	<i>Eriachne mucronata</i>	+		0.4 m	OP78.06	Flowering.
	<i>Eucalyptus gamophylla</i>	+		2 m	NC	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		5 m	OP11.08	
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	+		0.3 m	OP09.05	
	<i>Gossypium australe</i>	+		0.5 m	OP78.04	
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		0.5 m	OP23.02	

<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CR	OP09.07
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.6 m	OP03.08
<i>Ptilotus rotundifolius</i>	+	1 m	OP21.03
<i>Salsola tragus</i> subsp. <i>grandiflora</i>	(+)	0.4 m	OP21.06
<i>Santalum lanceolatum</i>	+	1 m	OP41.05
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+	0.5 m	OP78.03
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	2 m	NC
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	1 m	OP78.02
<i>Themeda triandra</i>	+	0.4 m	OP15.16
<i>Triodia pungens</i>	40%	0.3 m	OP78.01

**Ophthalmia** Site OP79**Described by** CH **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 736900 mE 7423260 mN**Habitat** Lower valley slope with minor gullies.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Hummock Grassland of *Triodia angusta* and *Triodia pungens* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*.

**Veg Condition** Pristine.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, 2% Twigs, 2% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		1 m	OP08.01
	<i>Acacia bivenosa</i>	+		1 m	OP27.03
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1 m	OP08.07
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	20%		2.5 m	OP27.01
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP79.01
	<i>Maireana triptera</i>	+		0.3 m	OP25.10
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.4 m	OP02.12
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.5 m	OP111.01
	<i>Themeda triandra</i>	+		0.4 m	OP04.18
	<i>Triodia angusta</i>	35%		0.2 m	OP55.06
	<i>Triodia pungens</i>	1%		0.4 m	OP33.01 Flowering.



**Ophthalmia** Site OP80**Described by** EC **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 743431 mE 7422590 mN**Habitat** Low undulating hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Dolerite.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

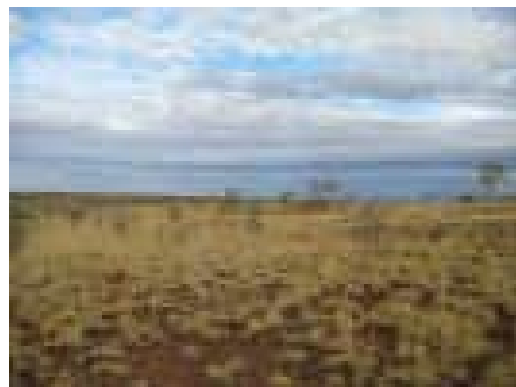
Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Scattered Shrubs of *Acacia inaequilatera* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Low Shrubs of *Acacia adsurgens*.**Veg Condition** Pristine.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: Old track 100 m from site.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia adsurgens</i>	+		0.5 m	OP80.02	
	<i>Acacia bivenosa</i>	+		3 m	OP84.01	
	<i>Acacia dictyophleba</i>	+		0.3 m	OP09.10	
	<i>Acacia inaequilatera</i>	1%		0.5-2.5 m	OP49.03	
	<i>Acacia tenuissima</i>	+		0.4 m	OPER02.02	
	<i>Corymbia hamersleyana</i>	+		4 m	OP11.09	
	<i>Cymbopogon ambiguus</i>	+		0.3 m	OP80.01	
	<i>Eremophila longifolia</i>	+		1.2 m	OP09.02	
	<i>Eriachne tenuiculmis</i>	+		0.3 m	OP11.05	
	<i>Eucalyptus gamophylla</i>	+		2 m	NC	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		3 m	OP11.08	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	NC	
	<i>Ptilotus calostachyus</i>	+		0.3 m	NC	
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03	
	<i>Rhagodia eremaea</i>	+		0.5 m	OP13.05	
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.3 m	OP05.08	
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		1 m	OP28.01	
	<i>Triodia wiseana</i>	45%		0.3 m	OP82.01	

**Ophthalmia**                      **Site**    OP81**Described by** BW    **Date** 18/05/2010 **Type** Q    100 x 10 m**Location**    Ophthalmia.**MGA Zone**    50                      736721 mE                      7421943 mN**Habitat**        Minor drainage line.**Soil**             Red-brown sandy loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone and quartz.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Malleesof *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Hummock Grassland of *Triodia angusta* with Mallees of *Eucalyptus repullulans* with Open Tussock Grassland of *Themeda triandra*.**Veg Condition**    Excellent to Pristine.**Fire Age**         Moderate.**Notes**            Aspect: N/A.

Bare Ground: 40%.

Litter Cover: 1% Logs, 5% Twigs, 4% Lvs.

Disturbance: Flooding.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon cunninghamii</i>	+		0.3 m	OP81.08
	<i>Acacia adsurgens</i>	+		0.8 m	OP81.05 Flowering.
	<i>Acacia aneura</i> var. <i>microcarpa</i>	+		1.5 m	OP81.04
	<i>Acacia synchronicia</i>	+		0.5 m	OP57.05
	<i>Acacia tetragonophylla</i>	+		1.2 m	NC
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus repullulans</i>	35%		2-3 m	OP81.01
	<i>Gossypium sturtianum</i> var. <i>sturtianum</i>	+		1.2 m	OP81.07
	<i>Maireana triptera</i>	+		0.2 m	OP81.09 Within the same vegetation association (out of plot).
	<i>Ptilotus exaltatus</i>	+		0.1 m	OP81.10 Within the same vegetation association (out of plot).
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.5 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1.2 m	OP81.03
	<i>Solanum lasiophyllum</i>	+		0.2 m	NC Within the same vegetation association (out of plot).
	<i>Themeda triandra</i>	20%		0.3 m	OP77.10

<i>Triodia angusta</i>	40%	0.5-0.8 m	OP81.02
<i>Triodia wiseana</i>	+	0.3 m	OP81.06



**Ophthalmia** Site OP83**Described by** CH **Date** 18/05/2010 **Type** Q 50 x 50 m**Location** Ophthalmia.**MGA Zone** 50 740540 mE 7424280 mN**Habitat** Flat hilltop.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata*subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gulliesVegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia**deserticola* subsp. *deserticola* with Scattered Shrubs of *Acacia pruinocarpa* with Scattered Hummock Grasses of *Triodia pungens*.**Veg Condition** Pristine.**Fire Age** Young to Moderate.**Notes** Aspect: N/A.

Bare Ground: 50%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		1.2 m	OP08.01
	<i>Acacia bivenosa</i>	+		1 m	OP27.03
	<i>Acacia pruinocarpa</i>	1%		2 m	OP02.08
	<i>Acacia rhodophloia</i>	+		0.5 m	OP31.01
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		5 m	OP83.04
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		0.5 m	OP43.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		10 m	OP31.04
	<i>Goodenia triodiophila</i>	+		0.2 m	OP83.05 Flowering.
	<i>Grevillea berryana</i>	+		1.2 m	OP83.01
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		3 m	OP53.02
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP83.02
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.6 m	OP83.03
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1 m	OP33.02
	<i>Triodia pungens</i>	1%		0.4 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	45%		0.2 m	OP02.14

**Ophthalmia** Site OP84**Described by** EC **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 743867 mE 7421142 mN**Habitat** Low undulating hilltop.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

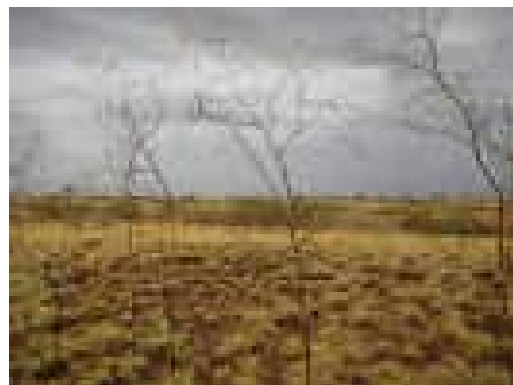
Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp.*eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrub of *Acacia bivenosa* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica* with Scattered Low Shrubs of *Acacia synchronicia*.**Veg Condition** Pristine.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 40%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	3%		2-3 m	OP84.01
	<i>Acacia dictyophleba</i>	+		1 m	OP84.02
	<i>Acacia pruinocarpa</i>	+		0.5 m	OP05.09
	<i>Acacia synchronicia</i>	1%		0.5-2 m	OP84.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		3-5 m	OP11.08
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		3.5 m	OP03.03
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.3 m	OP09.07
	<i>Melaleuca eleuterostachya</i>	+		0.5 m	OP07.01
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	50%		0.3 m	OP26.11

**Ophthalmia**                      **Site**    OP85**Described by** BW    **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      740452    **mE**                      7423823    **mN****Habitat**        Flat low plain between drainage lines.**Soil**             Red-brown loamy clay with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Shrubland of *Acacia aneura* var. *conifera*, *Acacia pruinocarpa* and *Eremophila longifolia* with Very Open Tussock Grassland of *Themeda triandra* with Low Open Woodland of *Eucalyptus xerothermica* with Scattered Hummock Grasses of *Triodia pungens*.

**Veg Condition**    Excellent.**Fire Age**        Young to Moderate.**Notes**            Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 2% Logs, 5% Twigs, 3% Lvs.

Disturbance: Cattle and fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>conifera</i>	2%		1.5 m	OP85.01	
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03	
	<i>Acacia pruinocarpa</i>	2%		>1 m	OP02.08	
	<i>Acacia tetragonophylla</i>	+		1.5 m	NC	
	<i>Capparis lasiantha</i>	+		1.3 m	OP69.02	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.5 m	OP85.06	Flowering.
	<i>Duperreya commixta</i>	+		CL	OP02.02	
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.5 m	OP85.11	
	<i>Eremophila longifolia</i>	1%		1.2 m	OP85.05	
	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>	+		0.2 m	OP85.04	Flowering.
	<i>Eucalyptus xerothermica</i>	3%		5-6 m	OP85.14	
	<i>Maireana georgei</i>	+		0.3 m	OP85.10	
	<i>Petalostylis labicheoides</i>	+		1.5 m	OP04.17	
	<i>Ptilotus exaltatus</i>	+		0.4 m	OP04.15	
	<i>Ptilotus obovatus</i>	+		0.5 m	OP85.08	
	<i>Ptilotus rotundifolius</i>	+		0.3 m	NC	Dead.
	<i>Rhagodia eremaea</i>	+		0.3 m	OP85.09	
	<i>Sclerolaena cornishiana</i>	+		0.2 m	OP85.02	
	<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+		0.5 m	OP85.13	
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.4 m	OP85.12	
	<i>Solanum lasiophyllum</i>	+		0.5 m	OP85.07	Flowering.

<i>Themeda triandra</i>	5%	0.4 m	OP77.10
<i>Triodia pungens</i>	1%	0.3 m	OP85.03

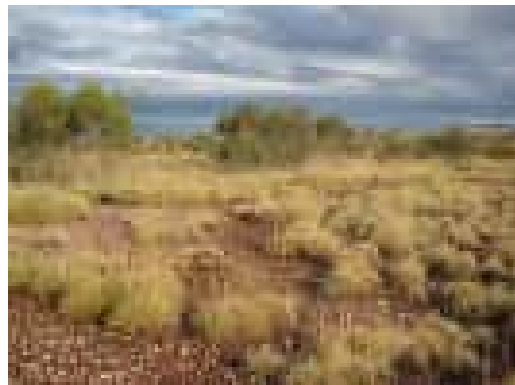


**Ophthalmia** Site OP86**Described by CS** Date 18/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 744495 mE 7421816 mN**Habitat** Rocky hillside.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Granite and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia**wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Very Open Mallees of *Eucalyptus trivalva* with Scattered Shrubs of *Melaleuca eleuterostachya*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: West.

Bare Ground: 60%.

Litter Cover: 1% Logs, 4% Twigs, 5% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon fraseri</i>	+		0.3 m	OP86.04
	<i>Acacia aff. adsurgens</i>	+		1.5 m	OP09.01 Flowering.
	<i>Acacia bivenosa</i>	+		2 m	OP03.01
	<i>Acacia pachyacra</i>	+		1 m	OP23.01
	<i>Acacia synchronicia</i>	+		1 m	OP11.01
	<i>Cymbopogon obtectus</i>	+		0.4 m	OP23.03
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>			1 m	NC Within the same vegetation association (out of plot).
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	10%		4 m	OP86.01
	<i>Eucalyptus trivalva</i>	2%		2.5 m	OP86.03
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07
	<i>Melaleuca eleuterostachya</i>	1%		0.5-1.5 m	OP07.01
	<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+		0.4 m	OP86.05
	<i>Santalum lanceolatum</i>	+		1.5 m	OP41.05
	<i>Senna glaucifolia</i>	+		0.5 m	OP36.06
	<i>Solanum lasiophyllum</i>	+		0.5 m	OP19.06
	<i>Tecticornia</i> sp.	+		0.4 m	OP86.05b Sterile.
	<i>Triodia wiseana</i>	40%		0.5 m	OP86.02

**Ophthalmia** Site OP87**Described by** CH **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 741460 mE 7424310 mN**Habitat** Lower slopes east of a Mulga stand.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia**wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia wiseana*, *Triodia pungens* and *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) with Low Woodland of *Eucalyptus pilbarensis*, *Eucalyptus xerothermica* and *Eucalyptus leucophloia* subsp. *leucophloia* with Open Shrubland of *Acacia bivenosa*, *Acacia ancistrocarpa*, *Acacia catenulata* subsp. *occidentalis* and *Acacia pruinocarpa*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: West.

Bare Ground: 40%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	1%		1.7 m	OP08.01
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.5 m	OP25.07
	<i>Acacia bivenosa</i>	2%		1.5 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	1%		1.8 m	OP25.08
	<i>Acacia pruinocarpa</i>	1%		1.5 m	OP02.08
	<i>Capparis lasiantha</i>	+		0.5 m	OP87.05
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus gamophylla</i>	+		4 m	OP02.21
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		8 m	OP31.04
	<i>Eucalyptus pilbarensis</i>	15%		4 m	OP87.03
	<i>Eucalyptus xerothermica</i>	2%		4 m	OP87.02
	<i>Hakea chordophylla</i>	+		2 m	OP87.04
	<i>Keraudrenia nephrosperma</i>	+		0.3 m	OP87.07
	<i>Ptilotus obovatus</i>	+		0.5 m	OP87.06
	<i>Rhagodia eremaea</i>	+		0.8 m	OP87.01
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.1 m	OP87.08
	<i>Triodia pungens</i>	10%		0.4 m	OP33.01
	<i>Triodia sp.</i> Shovelanna Hill (S. van Leeuwen 3835)	1%		3 m	OP02.14

*Triodia wiseana*

30%

0.3 m OP25.04

**Ophthalmia**                      **Site**    OP88**Described by** CS                                      **Date** 18/05/2010 **Type** Q                                      50 x 50 m**Location**    Ophthalmia.**MGA Zone**    50                      744529 **mE**                      7421180 **mN****Habitat**        Rocky hilltop and hillslope.**Soil**             Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone and granite.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia**brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia wiseana* and *Triodia brizoides* with Open Shrubland of *Acacia ancistrocarpa* and *Acacia inaequilatera* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*.**Veg Condition** Pristine.**Fire Age**        Old.**Notes**            Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	2%		1.5 m	OP11.02	Flowering.
	<i>Acacia dictyophleba</i>	+		1.5 m	OP09.10	Flowering.
	<i>Acacia inaequilatera</i>	1%		2 m	OP49.03	
	<i>Acacia kempeana</i>	+		1.5 m	OP05.02	
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09	
	<i>Acacia synchronicia</i>	+		1 m	OP11.01	
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11	
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.6 m	OP49.04	Flowering.
	<i>Cucumis maderaspatanus</i>	+		CR	OP35.02	
	<i>Cymbopogon obtectus</i>	+		0.8 m	OP23.03	
	<i>Duperreya commixta</i>	+		CL	OP03.05	
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+		2 m	OP01.02	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		0.5 m	OP41.01	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		4 m	OP11.08	
	<i>Euphorbia ? coghlanii</i>	+		0.3 m	OP35.10	
	<i>Peripleura arida</i>	+		0.4 m	OP88.03	
	<i>Pterocaulon sphaeranthoides</i>	+		0.4 m	OP88.02	
	<i>Ptilotus rotundifolius</i>	+		1 m	OP21.03	
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		1 m	OP78.02	
	<i>Solanum lasiophyllum</i>	+		0.5 m	OP19.06	Flowering.

<i>Triodia brizoides</i>	10%	0.3 m	OP64.01
<i>Triodia wiseana</i>	30%	1 m	OP88.01

**Ophthalmia**                      **Site**    OP89**Described by** BW                                      **Date** 18/05/2010 **Type** Q                                      50 x 50 m**Location**    Ophthalmia.**MGA Zone**    50                      741393 **mE**                      7423409 **mN****Habitat**        Floodplain.**Soil**             Red-brown loamy clay with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Very Open Mallees of *Eucalyptus trivalva*., *Acacia distans* and *Acacia catenulata* subsp. *occidentalis* with Very Open Hummock Grassland of *Triodia pungens*.

**Veg Condition** Excellent.**Fire Age**        Moderate.

**Notes**            Aspect: N/A.  
 Bare Ground: 90%.  
 Litter Cover: 1% Logs, 2% Twigs, 1% Lvs.  
 Disturbance: Flooding and cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.2 m	OP89.01
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	3%		4 m	OP89.08
	<i>Acacia distans</i>	5%		4-6 m	OP89.11 Flowering.
	<i>Acacia tetragonophylla</i>	+		1.5 m	NC
	<i>Bidens bipinnata</i>	+		0.1 m	OP89.05
	<i>Capparis lasiantha</i>	+		1.2 m	OP69.02
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+		0.6 m	OP89.07
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		0.6 m	OP89.09
	<i>Eucalyptus trivalva</i>	7%		3-5 m	OP55.03
	<i>Hibiscus burtonii</i>	+		0.2 m	OP89.06
	<i>Psyrax latifolia</i>	+		1.5 m	OP89.03
	<i>Ptilotus exaltatus</i>	+		0.5 m	OP04.15
	<i>Rhagodia eremaea</i>	+		0.5 m	OP89.04
	<i>Senna glaucifolia</i>	+		0.5 m	OP89.02
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		0.7 m	OP93.07
	<i>Triodia pungens</i>	8%		0.4 m	OP89.10

**Ophthalmia** Site OP90

**Described by** CS **Date** 18/05/2010 **Type** Q 50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50 745117 mE 7421671 mN

**Habitat** Low rocky hilltop.

**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.

**Rock Type** Isonstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835)

and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Hummock Grassland of *Triodia brizoides* and *Triodia melvillei* with Shrubland of *Acacia aneura* var. *aneura*, *Acacia ancistrocarpa*, *Acacia inaequilatera* with Scattered Shrubs of *Hakea lorea* subsp. *lorea*.



**Veg Condition** Pristine.

**Fire Age** Old to Moderate.

**Notes** Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 2% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	5%		1.5 m	OP11.02	
	<i>Acacia aneura</i> var. <i>aneura</i>	7%		2 m	OP11.11	
	<i>Acacia bivenosa</i>	+		1 m	OP03.01	
	<i>Acacia inaequilatera</i>	2%		1.5-2 m	OP49.03	
	<i>Acacia pachyacra</i>	+		1 m	OP23.01	
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09	
	<i>Codonocarpus cotinifolius</i>	+		3 m	OP17.06	
	<i>Corymbia hamersleyana</i>	+		3 m	OP11.09	
	<i>Cymbopogon obtectus</i>	+		0.7 m	OP23.03	
	<i>Eragrostis eriopoda</i>	+		0.4 m	OP90.01	Flowering.
	<i>Eremophila longifolia</i>	+		1 m	OP09.02	
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP11.13	
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2 m	OP23.02	
	<i>Keraudrenia nephrosperma</i>	+		0.7 m	OP22.14	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18	
	<i>Maireana triptera</i>	+		0.3 m	OP45.04	
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.8 m	OP03.08	
	<i>Rulingia luteiflora</i>	+		1 m	OP03.06	
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1 m	OP05.08	

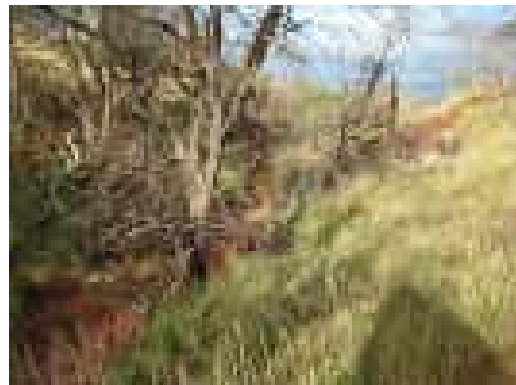
<i>Senna glaucifolia</i>	+	1 m	OP90.02	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1 m	OP03.07	
<i>Solanum lasiophyllum</i>	+	0.4 m	OP19.06	Flowering.
<i>Tribulus suberosus</i>	+	0.5 m	OP01.09	
<i>Triodia brizoides</i>	30%	0.4 m	OP64.01	
<i>Triodia melvillei</i>	2%	0.5 m	OP01.11	



**Ophthalmia** Site OP91**Described by** CH **Date** 18/05/2010 **Type** Q 100 x 10 m**Location** Ophthalmia.**MGA Zone** 50 742270 mE 7424430 mN**Habitat** Narrow incised gully.**Soil** Red-brown silt loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Hummock Grassland of *Triodia pungens* with Low Woodland of *Acacia citrinoviridis*, *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with Open Shrubland of *Gossypium robinsonii* and *Ficus brachypoda* with Scattered Low Shrubs of *Rulingia luteiflora*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: N/A.  
Bare Ground: 35%.  
Litter Cover: 1% Logs, 5% Twigs, 5% Lvs.  
Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia citrinoviridis</i>	30%		8 m	OP91.03
	<i>Acacia maitlandii</i>	+		1.2 m	OP51.03
	<i>Acacia pruinocarpa</i>	+		0.5 m	OP02.08
	<i>Acacia rhodophloia</i>	+		1.5 m	OP31.01
	<i>Acacia tetragonophylla</i>	+		2.5 m	OP25.02
	<i>Corymbia hamersleyana</i>	2%		5 m	OP04.21
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		1.5 m	OP91.06
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		1 m	OP43.05
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		6 m	OP31.04
	<i>Ficus brachypoda</i>	1%		5 m	OP91.01
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	+		0.6 m	OP02.10
	<i>Gossypium robinsonii</i>	1%		1.8 m	OP91.02
	<i>Grevillea berryana</i>	+		0.8 m	OP91.05
	<i>Petalostylis labicheoides</i>	+		2 m	OP04.17
	<i>Rulingia luteiflora</i>	1%		1 m	OP02.16
	<i>Senna glaucifolia</i>	+		0.5 m	OP91.04
	<i>Themeda triandra</i>	1%		0.5 m	OP04.18

*Triodia pungens*

45%

0.4 m OP33.01

Ophthalmia Site OP92

Described by EC Date 19/05/2010 Type Q

100 x 25 m

Location Ophthalmia.

MGA Zone 50 744496 mE 7422897 mN

Habitat Hill top with rocky exposed bedrock at peak.

Soil Red-brown skeletal loam with cobbles and pebbles covering the soil surface. Exposed bedrock present.

Rock Type Ironstone.

Vegetation Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia**synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hillsVegetation Sub-Association: Open Tussock Grassland of *Eriachne tenuiculmis* and *Themeda triandra* with Low Open Shrubland of *Ptilotus astrolasius* var. *astrolasius*, *Acacia synchronicia*, *Senna glutinosa*subsp. *x luerssenii*, *Maireana triptera* and *Eremophila phyllopoda* subsp. *obliqua* with Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodlandof *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Shrubs of *Acacia bivenosa* with Scattered Tall Shrubs of *Ficus brachypoda*.

Veg Condition Pristine.

Fire Age Young.

Notes Aspect: North and south (hill slopes).

Bare Ground: 75%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

## SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon fraseri</i>	+		0.2 m	OP92.03
	<i>Acacia ancistrocarpa</i>	+		1 m	OP92.04
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.4 m	OP11.11
	<i>Acacia aneura</i> var. <i>intermedia</i>	+		0.4 m	OP92.15
	<i>Acacia bivenosa</i>	1%		2 m	OP84.01
	<i>Acacia inaequilatera</i>	+		0.5 m	OP49.03
	<i>Acacia synchronicia</i>	1%		0.4 m	OP84.03
	<i>Capparis lasiantha</i>	+		0.3 m	OP03.09
	<i>Cymbopogon ambiguus</i>	+		0.3 m	OP80.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Enneapogon lindleyanus</i>	+		0.2 m	OP92.14
	<i>Eremophila longifolia</i>	+		1.5 m	OP92.10
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	1%		0.3-1 m	OP92.01
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP92.13
	<i>Eriachne tenuiculmis</i>	15%		0.3 m	OP92.08
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		3 m	OP11.08
	<i>Ficus brachypoda</i>	+		2.5 m	OP62.04

<i>Hibiscus haynaldii</i>	+	0.3 m	OP92.12
<i>Lepidium pedicellosum</i>	+	0.2 m	OP92.11
<i>Maireana georgei</i>	+	0.2 m	OP92.07
<i>Maireana triptera</i>	1%	0.3 m	OP92.18
<i>Paraneurachne muelleri</i>	+	0.3 m	OP23.04
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	2%	0.5 m	OP92.02
<i>Ptilotus exaltatus</i>	+	0.2 m	NC
<i>Ptilotus polystachyus</i>	+	0.1 m	OP92.06
<i>Ptilotus rotundifolius</i>	+	0.6 m	OP21.03
<i>Salsola tragus</i>	(+)	0.3 m	NC
<i>Santalum lanceolatum</i>	+	1.2 m	OP22.16
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+	0.1 m	OP92.09
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1 m	OP42.03
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	1 m	OP28.01
<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	1%	0.5-1 m	OP92.05
<i>Senna stricta</i>	+	0.5 m	OP03.13
<i>Solanum horridum</i>	+	0.1 m	OP03.14
<i>Solanum lasiophyllum</i>	+	0.2 m	OP10.13
<i>Themeda triandra</i>	5%	0.3 m	OP92.17
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	5%	0.3 m	OP26.11
<i>Triodia wiseana</i>	-	-	

**Ophthalmia** Site OP93**Described by** BW **Date** 18/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 742204 mE 7423381 mN**Habitat** Low hill**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

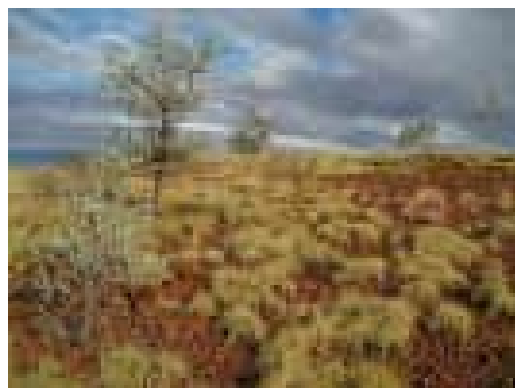
Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835)and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills.Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Scattered Shrubs of *Acacia inaequilatera*.**Veg Condition** Excellent to Pristine.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 85%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		0.5 m	OP93.02
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1.7 m	OP93.03
	<i>Acacia bivenosa</i>	+		1.2 m	OP27.03
	<i>Acacia inaequilatera</i>	1%		1-3 m	OP93.01
	<i>Acacia pruinocarpa</i>	+		0.6 m	OP02.08
	<i>Acacia synchronicia</i>	+		1.2 m	OP57.05
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		1.6 m	OP57.06
	<i>Eucalyptus trivalva</i>	+		1.2 m	OP93.04
	<i>Hakea chordophylla</i>	+		1.8 m	NC
	<i>Ptilotus exaltatus</i>	+		0.4 m	OP04.15
	<i>Rhagodia eremaea</i>	+		0.5 m	OP93.08
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.4 m	OP93.06
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.5 m	OP93.05
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.8 m	OP63.02
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		0.7 m	OP93.07
	<i>Solanum lasiophyllum</i>	+		0.2 m	OP85.07 Flowering.
	<i>Triodia wiseana</i>	15%		0.3 m	OP93.09

**Ophthalmia** Site OP94**Described by** EC **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 744444 mE 7422457 mN**Habitat** Low hill top and slopes.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.**Rock Type** Dolerite, ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

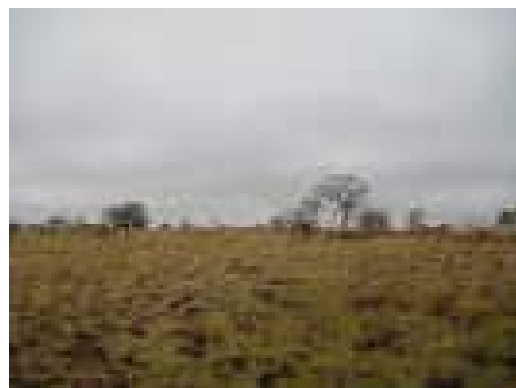
Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills.Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and *Acacia bivenosa* with Scattered Low Trees of *Corymbia hamersleyana* with Scattered Shrubs of *Acacia dictyophleba*, *Acacia pachyacra* and *Acacia pruinocarpa*.**Veg Condition** Pristine.**Fire Age** Moderate to Old.**Notes** Aspect: North.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	1%		2.5 m	OP84.01
	<i>Acacia dictyophleba</i>	+		1.5 m	OP09.10
	<i>Acacia inaequilatera</i>	2%		0.3-3 m	OP49.03
	<i>Acacia pachyacra</i>	+		1.2 m	OP20.03
	<i>Acacia pruinocarpa</i>	+		2 m	OP05.09
	<i>Chrysocephalum pterochaetum</i>	+		0.3 m	OP94.01
	<i>Corymbia hamersleyana</i>	1%		3.5 m	OP11.09
	<i>Eriachne mucronata</i>	+		0.3 m	OP94.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		3 m	OP11.08
	<i>Hakea chordophylla</i>	+		2 m	OP26.05
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CR	OP09.07
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP21.03
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.3 m	OP05.08
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		1.2 m	OP92.09
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP42.03
	<i>Triodia wiseana</i>	50%		0.3 m	OP94.02

**Ophthalmia** Site OP95**Described by** CH **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 742940 mE 7424320 mN**Habitat** Upland flat alluvial apron.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills.Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrubland of *Hakea chordophylla* and *Hakea lorea* subsp. *lorea* with Low Open Shrubland of *Acacia ancistrocarpa* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, 5% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		0.4 m	OP08.03 Flowering.
	<i>Acacia adsurgens</i>	+		1 m	OP95.02 Flowering.
	<i>Acacia ancistrocarpa</i>	4%		1 m	OP08.01
	<i>Acacia bivenosa</i>	+		1.2 m	OP27.03
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	2%		6 m	OP83.04
	<i>Hakea chordophylla</i>	5%		5 m	OP99.01
	<i>Hakea lorea</i> subsp. <i>lorea</i>	2%		3 m	OP53.02
	<i>Ptilotus calostachyus</i>	+		0.6 m	OP02.07
	<i>Senna glaucifolia</i>	+		0.5 m	OP95.03
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1 m	OP33.02
	<i>Senna sericea</i>	+		0.4 m	OP95.01
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	35%		0.3 m	OP02.14

**Ophthalmia** Site OP96**Described by EC** Date 19/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 745282 mE 7422651 mN**Habitat** Floodplain beside river.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone, quartz and dolerite.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Open Shrubland of *Acacia aneura* var. *pilbarana* with Very Open Hummock Grassland of *Triodia pungens* with Open Shrubland of *Eremophila forrestii* subsp. *forrestii* with Scattered Low Trees of *Eucalyptus xerothermica*.

**Veg Condition** Very Good to Excellent.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 2% Logs, 2% Twigs, 1% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.5 m	OP11.11
	<i>Acacia aneura</i> var. <i>pilbarana</i>	10%		2-5 m	OP96.01
	<i>Acacia bivenosa</i>	+		1 m	OP84.01
	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	+		2 m	OP96.04
	<i>Acacia tetragonophylla</i>	+		0.6 m	OP03.11
	<i>Capparis lasiantha</i>	+		0.5 m	OP03.09
	<i>Chrysopogon fallax</i>	(+)		0.3 m	NC
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.2 m	OP96.07 Flowering.
	<i>Duperreya commixta</i>	+		4 m	OP03.05
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	2%		1-1.5 m	OP96.06
	<i>Eucalyptus xerothermica</i>	1%		5 m	OP09.03
	<i>Hibiscus haynaldii</i>	+		0.1 m	OP92.12
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP96.08
	<i>Petalostylis labicheoides</i>	+		1.5 m	OP12.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 m	OP03.08
	<i>Rhagodia eremaea</i>	+		1 m	OP13.05
	<i>Sclerolaena cornishiana</i>	+		0.1 m	OP96.03
	<i>Sclerolaena densiflora</i>	+		0.3 m	OP96.02
	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i>	+		1.5 m	OP96.05



*Triodia pungens*

10%

0.3 m OP26.07

**Ophthalmia** Site OP97**Described by** BW **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 742938 mE 7423762 mN**Habitat** Gently sloping plain.**Soil** Red-brown clayey loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland

Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Low Woodland of *Acacia aneura* var. *aneura*, *Corymbia deserticola* subsp. *deserticola* and *Acacia catenulata* subsp. *occidentalis* with Open Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Grevillea berryana* and *Acacia tetragonophylla* with Scattered Shrubs of *Eremophila fraseri* subsp. *fraseri*.

**Veg Condition** Excellent.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 2% Logs, 4% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	15%		5 m	OP97.02
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	3%		5 m	OP97.01
	<i>Acacia citrinoviridis</i>	+		0.7 m	OP97.09
	<i>Acacia rhodophloia</i>	+		2.5 m	OP97.05
	<i>Acacia tetragonophylla</i>	1%		4 m	NC
	<i>Anthobolus leptomerioides</i>	+		0.4 m	OP97.08
	<i>Bidens bipinnata</i>	+		0.1 m	OP59.08
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.1 m	OP97.11
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		4 m	OP97.06
	<i>Eragrostis eriopoda</i>	+		0.2 m	OP97.12
	<i>Eremophila forrestii</i> x <i>latrobei</i>	+		0.7 m	OP97.04
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	1%		0.5-1.5 m	OP89.09
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		0.4 m	OP97.07
	<i>Grevillea berryana</i>	3%		2 m	OP97.03
	<i>Triodia pungens</i>	15%		0.4 m	OP97.10

**Ophthalmia** Site OP98**Described by EC** Date 19/05/2010 **Type Q** 100 x 25 m**Location** Ophthalmia.**MGA Zone** 50 745301 mE 7422012 mN**Habitat** Major drainage line.**Soil** Red-brown clayey loam with a deep layer of cobbles and pebbles covering the surface.**Rock Type** Ironstone, dolerite, calcrete and quartz.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Tussock Grassland of *Themeda triandra* and *Amphipogon sericeus* (Newman form BR2-21) with High Open Shrubland of *Acacia citrinoviridis*, *Petalostylis labicheoides*, *Acacia pyrifolia* and *Grevillea wickhamii* with Low Open Woodland of *Eucalyptus victrix* with Open Shrubs of *Rulingia luteiflora* with Scattered Hummock Grasses of *Triodia melvillei*.

**Veg Condition** Excellent.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 85%.

Litter Cover: &lt;1% Logs, 2% Twigs, 5% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		2.5 m	OP03.01
	<i>Acacia citrinoviridis</i>	4%		1-3 m	OP98.02 Flowering.
	<i>Acacia pyrifolia</i>	3%		1-4 m	NC
	<i>Acacia synchronicia</i>	+		0.2 m	OP84.03
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	6%		0.3 m	OP20.04
	<i>Bidens bipinnata</i>	+		0.1 m	OP09.19
	<i>Cleome viscosa</i>	+		0.1 m	NC
	<i>Cucumis maderaspatanus</i>	+		CL	OP35.02
	<i>Cymbopogon obtectus</i>	+		0.5 m	OP20.02
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.3 m	OP15.02
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1 m	OP98.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eucalyptus victrix</i>	3%		8-12 m	OP29.04
	<i>Eulalia aurea</i>	+		0.3 m	OP98.04
	<i>Goodenia stellata</i>	+		0.1 m	OP15.12
	<i>Gossypium sturtianum</i>	+		0.3 m	OP38.01
	<i>Grevillea wickhamii</i>	2%		1-3 m	OP17.03
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07
	<i>Petalostylis labicheoides</i>	3%		1-4.5 m	OP12.01 Flowering.

<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.3 m	OP03.08
<i>Rulingia luteiflora</i>	3%	1-2.5 m	OP03.06
<i>Santalum lanceolatum</i>	+	1-2 m	OP22.16
<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+	1.5 m	OP98.03
<i>Themeda triandra</i>	10%	0.3 m	OP15.16
<i>Triodia melvillei</i>	1%	0.3 m	OP16.07

**Ophthalmia**                      **Site**    OP99**Described by** CH    **Date** 19/05/2010 **Type** Q    50 x 50 m**Location**    Ophthalmia.**MGA Zone**    50                      743370 **mE**                      7424590 **mN****Habitat**        Upland plain.**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens*and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A.**pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia**hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and

pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. vanLeeuwen 3835) and *Triodia pungens* with Low Open Woodland of *Corymbia deserticola* subsp.*deserticola* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Shrubs of *Acacia bivenosa*.**Veg Condition**    Pristine.**Fire Age**         Moderate.**Notes**             Aspect: South (slight).

Bare Ground: 65%.

Litter Cover: &lt;1% Logs, 2% Twigs, 1% Lvs.

Disturbance: Rehabilitated track to the north of the site.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia bivenosa</i>	1%		1.3 m	OP27.03	
	<i>Acacia citrinoviridis</i>	+		1.7 m	OP99.02	
	<i>Acacia rhodophloia</i>	+		1 m	OP31.01	
	<i>Acacia tetragonophylla</i>	+		2 m	OP25.02	
	<i>Anthobolus leptomerioides</i>	+		1.5 m	OP31.02	
	<i>Codonocarpus cotinifolius</i>	+		1.5 m	OP02.13	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	5%		6 m	OP83.04	
	<i>Eucalyptus gamophylla</i>	+		4 m	OP02.21	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	5%		7 m	OP31.04	
	<i>Grevillea berryana</i>	+		1.2 m	OP31.03	
	<i>Hakea chordophylla</i>	+		2 m	OP99.01	
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP83.02	
	<i>Rulingia luteiflora</i>	+		1 m	OP02.16	
	<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>	+		1.2 m	OP33.02	
	<i>Triodia pungens</i>	1%		0.4 m	OP33.01	Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	30%		0.2 m	OP02.14	



**Ophthalmia** Site OP101**Described by** BW **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 742933 mE 7423183 mN**Habitat** Low undulating hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of

*Triodia brizoides* with Open Shrubland of *Acacia**synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia*subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with Scattered Tall Shrubs of *Acacia inaequilatera*.**Veg Condition** Excellent.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		0.6 m	OP93.02
	<i>Acacia dictyophleba</i>	+		0.8 m	OP59.16
	<i>Acacia inaequilatera</i>	1%		2 m	OP93.01
	<i>Acacia kempeana</i>	+		0.7 m	OP101.02
	<i>Acacia pruinocarpa</i>	+		0.6 m	OP02.08
	<i>Acacia synchronicia</i>	+		0.8 m	OP57.05
	<i>Acacia tetragonophylla</i>	+		0.4 m	NC
	<i>Cucumis maderaspatanus</i>	+		CL	OP101.01
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		1.5 m	OP57.06
	<i>Maireana georgei</i>	+		0.4 m	OP85.10
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP101.03
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	+		0.4 m	OP93.05
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.2 m	OP63.02
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		0.7 m	OP28.01
	<i>Themeda triandra</i>	+		0.4 m	OP77.10
	<i>Triodia wiseana</i>	35%		0.3 m	OP93.09

**Ophthalmia**                      **Site**    OP102**Described by** CS                                      **Date** 19/05/2010 **Type** Q                                      50 x 50 m**Location**    Ophthalmia.**MGA Zone**    50                      746097 mE                      7422054 mN**Habitat**        Low rocky hills.**Soil**             Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone and quartz.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia**wiseana*, *T. angusta* and *T. brizoides* with Open Malleesof *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of*Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica* with High Open Shrubland of *Acacia bivenosa*.**Veg Condition**    Pristine.**Fire Age**         Moderate.**Notes**            Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon cunninghamii</i>	+		0.4 m	OP102.01
	<i>Abutilon fraseri</i>	+		0.3 m	OP86.04
	<i>Acacia bivenosa</i>	2%		2.5 m	OP03.01
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01
	<i>Cymbopogon obtectus</i>	+		0.4 m	OP23.03
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		1 m	OP11.04
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	3%		2.5 m	OP47.02
	<i>Maireana georgei</i>	+		0.2 m	OP102.03
	<i>Maireana triptera</i>	+		0.2 m	OP45.04
	<i>Ptilotus exaltatus</i>	+		0.1 m	NC
	<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+		0.4 m	OP21.06
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.6 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP03.07
	<i>Solanum lasiophyllum</i>	+		0.4 m	OP19.06
	<i>Triodia wiseana</i>	30%		0.5 m	OP102.02



**Ophthalmia**                      **Site**    OP103**Described by** CH    **Date** 19/05/2010 **Type** Q

80 x 30 m

**Location**    Ophthalmia.**MGA Zone**    50                      743660 **mE**                      7423850 **mN****Habitat**        Drainage run-on area.**Soil**             Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

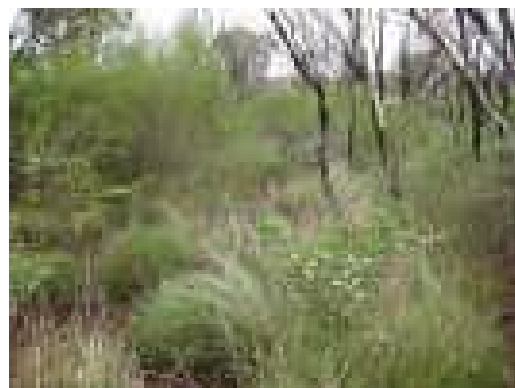
Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. *Shovelanna* Hill (S. van Leeuwen 3835), *T. pungens*and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A.**pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia**hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gulliesVegetation Sub-Association: Hummock Grassland of *Triodia pungens* with Open Scrub of *Petalostylis**labicheoides* and *Acacia citrinoviridis* with Scattered Low Trees of *Corymbia hamersleyana* withScattered Mallees of *Eucalyptus socialis* subsp. *eucentrica* with Scattered Shrubs of *Acacia bivenosa*.**Veg Condition**    Pristine.**Fire Age**         Moderate to Young.**Notes**             Aspect: N/A.

Bare Ground: 20%.

Litter Cover: &lt;1% Logs, 5% Twigs, 5% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia ancistrocarpa</i>	+		1.2 m	OP08.01	
	<i>Acacia bivenosa</i>	1%		1.6 m	OP27.03	
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		2 m	OP25.08	
	<i>Acacia citrinoviridis</i>	20%		2.5 m	OP91.03	
	<i>Acacia monticola</i>	+		2 m	OP06.07	
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP02.08	
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	+		6 m	OP83.04	
	<i>Corymbia hamersleyana</i>	1%		10 m	OP04.21	
	<i>Eucalyptus gamophylla</i>	+		3 m	OP02.21	
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	1%		2.5 m	OP27.01	
	<i>Gastrolobium grandiflorum</i>	+		1.8 m	OP06.01	
	<i>Petalostylis labicheoides</i>	20%		2.5 m	OP04.17	
	<i>Rulingia luteiflora</i>	+		1.8 m	OP02.16	
	<i>Senna glaucifolia</i>	+		0.8 m	OP91.04	
	<i>Solanum lasiophyllum</i>	+		0.2 m	OP43.03	
	<i>Triodia pungens</i>	50%		0.4 m	OP33.01	Flowering.

**Ophthalmia**                      **Site**    OP104  
**Described by** CS                      **Date** 19/05/2010 **Type** Q                      100 x 25 m

**Location**    Ophthalmia.  
**MGA Zone**    50            746141    mE            7423148    mN  
**Habitat**        Drainage line.  
**Soil**             Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.  
**Rock Type**    Ironstone.



**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Shrubland of *Petalostylis labicheoides* and *Acacia maitlandii* with Open Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Paraneurachne muelleri* with Shrubland of *Dodonaea lanceolata* var. *lanceolata*, *Santalum lanceolatum*, *Rulingia luteiflora*, *Acacia monticola*, *Acacia bivenosa* and *Acacia pachyacra* with Very Open Hummock Grassland of *Triodia melvillei* with Low Open Woodland of *Eucalyptus xerothermica* and *Corymbia hamersleyana*.

**Veg Condition**    Excellent.

**Fire Age**         Old.

**Notes**            Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 1% Logs, 5% Twigs, 10% Lvs.

Disturbance: Cattle and introduced species

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		0.5 m	OP52.05	
	<i>Acacia</i> aff. <i>adsurgens</i>	+		1 m	OP09.01	
	<i>Acacia ancistrocarpa</i>	1%		1.5 m	OP11.02	
	<i>Acacia aneura</i> var. <i>aneura</i>	+		0.4 m	OP11.11	
	<i>Acacia bivenosa</i>	1%		2 m	OP03.01	
	<i>Acacia dictyophleba</i>	+		1.5-2 m	OP09.10	
	<i>Acacia maitlandii</i>	15%		1.5-2 m	OP22.13	
	<i>Acacia monticola</i>	2%		2 m	OP52.03	
	<i>Acacia pachyacra</i>	1%		1 m	OP23.01	
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09	
	<i>Acacia pyrifolia</i>	+		1 m	NC	
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11	
	<i>Bidens bipinnata</i>	+		0.2 m	OP09.19	
	<i>Bonamia rosea</i>	+		0.4 m	OP104.01	
	<i>Chrysopogon fallax</i>	+		0.9 m	NC	
	<i>Corymbia hamersleyana</i>	1%		5 m	OP11.09	
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	5%		1.5-2 m	OP44.02	
	<i>Duperreya commixta</i>	+		CL	OP03.05	

<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	+	1 m	OP36.01
<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+	0.5 m	OP13.03
<i>Eucalyptus gamophylla</i>	+	2 m	NC
<i>Eucalyptus xerothermica</i>	5%	5 m	OP09.03
<i>Eulalia aurea</i>	5%	0.5 m	OP09.09
<i>Goodenia microptera</i>	+	0.3 m	OP52.04
<i>Goodenia stellata</i>	+	0.2 m	OP15.12
<i>Haloragis gossei</i> var. <i>gossei</i>	+	0.1 m	OP104.04
<i>Hybanthus aurantiacus</i>	+	0.3 m	OP29.06 Flowering.
<i>Isotropis forrestii</i>	+	0.3 m	OP104.03
<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CL	OP09.07
<i>Keraudrenia nephrosperma</i>	+	0.4 m	OP22.14
<i>Maytenus</i> sp. Mt Windell	+	0.5 m	OP104.06
<i>Mirbelia viminalis</i>	+	0.5 m	OP104.02
<i>Paraneurachne muelleri</i>	6%	0.4 m	OP35.07
<i>Petalostylis labicheoides</i>	15%	1.5-2 m	OP12.01 Flowering.
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.6 m	OP03.08
<i>Rhyncharrhena linearis</i>	+	CR	OP15.10
<i>Rulingia luteiflora</i>	2%	1.5 m	OP03.06
<i>Rutidosis helichrysoides</i>	+	0.4 m	OP35.06
<i>Santalum lanceolatum</i>	5%	1.5-2 m	OP41.05
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+	0.6 m	OP21.04
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	0.6 m	OP104.05
<i>Solanum lasiophyllum</i>	+	0.4 m	OP19.06
<i>Themeda triandra</i>	5%	0.5 m	OP15.16
<i>Triodia melvillei</i>	10%	0.6 m	OP01.11 Flowering.

**Ophthalmia**                      **Site** OP105  
**Described by** BW                      **Date** 19/05/2010 **Type** Q                      100 x 25 m

**Location** Ophthalmia.

**MGA Zone** 50                      744179 **mE**                      7424568 **mN**

**Habitat** Major drainage line.

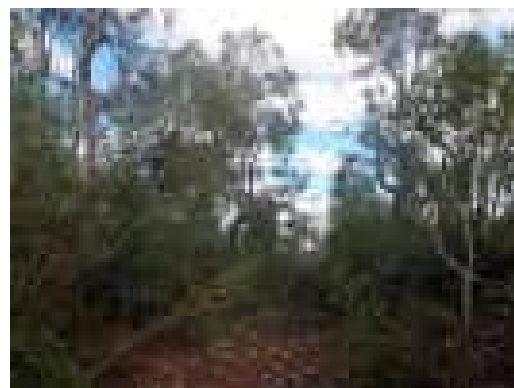
**Soil** Red-brown loam with loam on the banks. Cobbles and pebbles cover the soil surface

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Shrubland of *Acacia citrinoviridis*, *Petalostylis labicheoides* and *Acacia pyrifolia* with Very Open Tussock Grassland of *Themeda triandra* and *Eriachne mucronata* with Very Open Hummock Grassland of *Triodia pungens* with Scattered Tall Trees of *Corymbia hamersleyana*.



**Veg Condition** Excellent.

**Fire Age** Moderate.

**Notes** Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 1% Logs, 4% Twigs, 5% Lvs.

Disturbance: Flooding

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon fraseri</i>	+		0.2 m	OP105.05
	<i>Acacia aneura</i> var. <i>conifera</i>	+		0.9 m	OP107.10
	<i>Acacia citrinoviridis</i>	8%		2-3 m	OP107.02
	<i>Acacia pyrifolia</i>	2%		2-3 m	NC
	<i>Bidens bipinnata</i>	+		0.1 m	OP59.08
	<i>Bonamia rosea</i>	+		0.2 m	OP28.06
	<i>Corymbia hamersleyana</i>	1%		3-6 m	OP105.01
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1.2 m	OP107.14
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Enneapogon lindleyanus</i>	+		0.2 m	OP105.04
	<i>Eriachne mucronata</i>	5%		0.4 m	OP107.01
	<i>Eucalyptus victrix</i>	+		5 m	OP107.13
	<i>Gossypium robinsonii</i>	+		1-3 m	OP107.05
	<i>Hakea chordophylla</i>	+		2 m	NC
	<i>Hybanthus aurantiacus</i>	+		0.2 m	OP105.03
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.7 m	OP107.04
	<i>Petalostylis labicheoides</i>	4%		2-3 m	OP04.17
	<i>Ptilotus obovatus</i>	+		0.4 m	OP105.02
	<i>Rulingia luteiflora</i>	+		1.2 m	OP02.16

<i>Santalum lanceolatum</i>	+	2-3 m	OP105.06
<i>Themeda triandra</i>	5%	0.4 m	OP77.10
<i>Tribulus suberosus</i>	+	0.4 m	NC
<i>Triodia pungens</i>	8%	0.4 m	OP107.12

**Ophthalmia** Site OP106**Described by CS** Date 19/05/2010 **Type Q** 100 x 25 m**Location** Ophthalmia.**MGA Zone** 50 746228 **mE** 7422586 **mN****Habitat** Floodplain/ drainage line.**Soil** Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.**Rock Type****Vegetation** Broad Floristic Formation: *Triodia* Hummock GrasslandVegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia*subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hillsVegetation Sub-Association: Open Hummock Grassland of *Triodia melvillei* and *Triodia wiseana* with Open Tussock Grassland of *Themeda triandra* and *Paraneurachne muelleri* with Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica* with High Open Shrubland of *Acacia bivenosa* with Open Shrubland of *Acacia pachyacra*, *Acacia synchronicia*, *Acacia tetragonophylla* and *Acacia dictyophleba*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: North (slight).  
Bare Ground: 65%.  
Litter Cover: 1% Logs, 1% Twigs, 1% Lvs.  
Disturbance: N/A.**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Abutilon cunninghamii</i>	+		0.4 m	OP102.01
	<i>Acacia bivenosa</i>	5%		2.5 m	OP03.01
	<i>Acacia dictyophleba</i>	1%		1 m	OP09.10 Flowering.
	<i>Acacia maitlandii</i>	+		1.5 m	OP22.13
	<i>Acacia pachyacra</i>	2%		1 m	OP23.01
	<i>Acacia synchronicia</i>	1%		1 m	OP11.01
	<i>Acacia tetragonophylla</i>	1%		1 m	OP03.11
	<i>Capparis lasiantha</i>	+		1 m	OP03.09
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila cuneifolia</i>	+		0.6 m	OP11.10
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	10%		3 m	OP47.02
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07
	<i>Keraudrenia nephrosperma</i>	+		0.5 m	OP22.14
	<i>Paraneurachne muelleri</i>	2%		0.4 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.4 m	OP03.08
	<i>Ptilotus rotundifolius</i>	+		1 m	OP21.03
	<i>Rutidosia helichrysoides</i>	+		0.3 m	OP35.06
	<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+		0.4 m	OP21.06
	<i>Santalum lanceolatum</i>	+		1.5 m	OP41.05
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+		0.6 m	OP21.04

<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	OP03.07
<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06
<i>Themeda triandra</i>	10%	0.5 m	OP15.16
<i>Triodia melvillei</i>	20%	0.4 m	OP01.11
<i>Triodia wiseana</i>	5%	0.4 m	OP102.02

**Ophthalmia**                      **Site** OP107  
**Described by** BW                      **Date** 19/05/2010 **Type** Q                      100 x 25 m

**Location** Ophthalmia.

**MGA Zone** 50                      744588 **mE**                      7423898 **mN**

**Habitat** Major drainage line.

**Soil** Red-brown sand with loam on the banks. Cobbles and pebbles cover the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland



Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Open Shrubland of *Petalostylis labicheoides*, *Acacia citrinoviridis* and *Acacia pyrifolia* with Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 383) with Open Tussock Grassland of *Eriachne mucronata* and *Themeda triandra* with Low Open Woodland of *Eucalyptus victrix* and *Eucalyptus xerothermica* with Scattered Mallees of *Eucalyptus gamophylla*.

**Veg Condition** Very Good to Excellent.

**Fire Age** Young.

**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 2% Logs, 3% Twigs, 4% Lvs.

Disturbance: Fire and flooding.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>conifera</i>	+		0.8 m	OP107.10
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03
	<i>Acacia citrinoviridis</i>	5%		4 m	OP107.02
	<i>Acacia dictyophleba</i>	+		0.7 m	OP59.16
	<i>Acacia maitlandii</i>	+		1.5 m	NC
	<i>Acacia pyrifolia</i>	1%		2.5 m	NC
	<i>Acacia sibirica</i>	+		0.4 m	OP107.11 Linear form.
	<i>Bidens bipinnata</i>	+		0.1 m	OP59.08
	<i>Cucumis maderaspatanus</i>	+		CL	NC
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		0.9 m	OP107.14
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eriachne mucronata</i>	7%		0.4 m	OP107.01
	<i>Eucalyptus gamophylla</i>	1%		4 m	OP02.21
	<i>Eucalyptus victrix</i>	3%		8-10 m	OP107.13
	<i>Eucalyptus xerothermica</i>	2%		6 m	OP85.14
	<i>Goodenia stellata</i>	+		0.1 m	OP107.09
	<i>Gossypium robinsonii</i>	+		0.7 m	OP107.05
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.6 m	OP107.04



<i>Petalostylis labicheoides</i>	10%	3-4 m	OP04.17
<i>Ptilotus obovatus</i>	+	0.3 m	OP107.06
<i>Rhynchosia minima</i>	+	0.1 m	OP107.07
<i>Rulingia luteiflora</i>	+	0.8 m	OP02.16
<i>Salsola tragus</i> subsp. <i>grandiflora</i>	(+)	0.3 m	OP04.05
<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	+	0.6 m	OP107.08
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+	0.8 m	OP107.03
<i>Themeda triandra</i>	4%	0.3 m	OP77.10
<i>Triodia pungens</i>	6%	0.4 m	OP107.12
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	5%	0.2 m	OP113.09

**Ophthalmia**                      **Site**    OP108**Described by** CS                                      **Date** 19/05/2010 **Type** Q                                      100 x 25 m**Location**    Ophthalmia.**MGA Zone**    50                      746680 mE                      7423367 mN**Habitat**        Drainage line.**Soil**             Red-brown clayey loam on banks with deep pebbles in the river bed.**Rock Type**    Ironstone, marramamba and quartz.**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Open Shrubland of *Acacia citrinoviridis*, *Petalostylis labicheoides*, *Dodonaea lanceolata* var. *lanceolata* and *Acacia monticola* with Very Open Tussock Grassland of *Themeda triandra* and *Paraneurachne muelleri* with Very Open Hummock Grassland of *Triodia melvillei* Open Shrubland of *Rulingia luteiflora*, *Acacia pyrifolia* and *Indigofera georgei* with Low Open Woodland of *Eucalyptus xerothermica* and *Corymbia hamersleyana* with Very Open Herbs of *\*Bidens bipinnata*.

**Veg Condition**    Excellent.**Fire Age**         Moderate.**Notes**            Aspect: N/A.

Bare Ground: 60%.

Litter Cover: 10% Logs, 5% Twigs, 20% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11
	<i>Acacia citrinoviridis</i>	5%		2 m	OP01.05
	<i>Acacia monticola</i>	1%		2 m	OP52.03
	<i>Acacia pyrifolia</i>	1%		1.5 m	NC
	<i>Bidens bipinnata</i>	1%		0.2 m	OP09.19
	<i>Cleome viscosa</i>	(+)		0.3 m	NC
	<i>Corymbia hamersleyana</i>	1%		4 m	OP11.09
	<i>Cymbopogon ambiguus</i>	+		0.8 m	OP108.01
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	2%		2 m	OP44.02
	<i>Dodonaea pachyneura</i>	+		1.5 m	OP108.02
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila longifolia</i>	+		2 m	OP09.02
	<i>Eucalyptus xerothermica</i>	2%		5 m	OP09.03
	<i>Gossypium robinsonii</i>	+		2 m	OP68.01
	<i>Grevillea wickhamii</i>	+		0.5 m	NC
	<i>Hybanthus aurantiacus</i>	+		0.4 m	OP29.06
	<i>Indigofera georgei</i>	1%		1 m	OP29.02

<i>Isotropis forrestii</i>	+	0.5 m	OP104.03
<i>Mirbelia viminalis</i>	+	1 m	OP104.02
<i>Paraneurachne muelleri</i>	2%	0.4 m	OP35.07
<i>Peripleura arida</i>	+	0.4 m	OP108.03
<i>Petalostylis labicheoides</i>	5%	2.5 m	OP12.01
<i>Psydrax latifolia</i>	+	1 m	OP10.12
<i>Ptilotus obovatus</i>	+	1 m	OP15.08
<i>Rhagodia eremaea</i>	+	1 m	OP13.05
<i>Rhynchosia minima</i>	+	CR	OP76.01
<i>Rulingia luteiflora</i>	2%	1.5 m	OP03.06
<i>Rutidosis helichrysoides</i>	+	0.4 m	OP35.06
<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+	0.8 m	OP21.06
<i>Santalum lanceolatum</i>	+	1.5 m	OP41.05
<i>Sida fibulifera</i>	+	CR	OP15.01
<i>Themeda triandra</i>	5%	0.5 m	OP15.16
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	(+)	0.3 m	NC
<i>Triodia melvillei</i>	5%	0.5 m	OP01.11

**Ophthalmia** Site OP109**Described by** CH **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 745120 mE 7423730 mN**Habitat** Run-on/wash area.**Soil** Red-brown silt loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Scrub of *Acacia pruinocarpa*, *Acacia citrinoviridis* and *Acacia catenulata* subsp. *occidentalis* with Open Shrubland of *Acacia aneura* var. *aneura* and *Acacia ayersiana* with Scattered Shrubs of *Eremophila forrestii* subsp. *forrestii*.

**Veg Condition** Excellent.**Fire Age** Young.**Notes** Aspect: N/A.

Bare Ground: 50%.

Litter Cover: 1% Logs, 15% Twigs, 1% Lvs.

Disturbance: Fire.

**SPECIES LIST:**

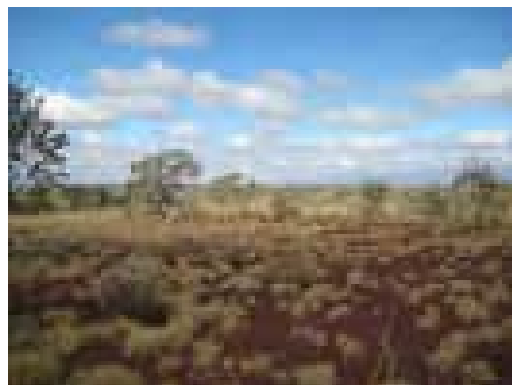
Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	5%		2 m	OP25.07 Resprouting.
	<i>Acacia ayersiana</i>	1%		2 m	OPPOCH4
	<i>Acacia bivenosa</i>	+		2 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	5%		2.5 m	OP25.08 Resprouting.
	<i>Acacia citrinoviridis</i>	10%		2.5 m	OP91.03 Resprouting. Dead trees to 8 m.
	<i>Acacia pruinocarpa</i>	20%		3 m	OP02.08
	<i>Anthobolus leptomerioides</i>	+		1.5 m	OP31.02
	<i>Cymbopogon ambiguus</i>	+		0.2 m	OP109.04
	<i>Eragrostis eriopoda</i>	+		0.2 m	OP109.02
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	1%		1 m	OP109.01
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2.5 m	OP53.02
	<i>Rhagodia eremaea</i>	+		0.4 m	OP109.05
	<i>Rulingia luteiflora</i>	+		1.8 m	OP02.16
	<i>Sida ectogama</i>	+		0.4 m	OP109.03
	<i>Solanum lasiophyllum</i>	+		0.4 m	OP43.03
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	+		0.2 m	OP02.14

**Ophthalmia** Site OP110**Described by** EC **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 746211 mE 7424929 mN**Habitat** Low hill top.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrubland of *Acacia inaequilatera* and *Hakea chordophylla* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Open Shrubland of *Acacia bivenosa* and *Acacia adsurgens* with Scattered Mallees of *Eucalyptus gamophylla*.**Veg Condition** Pristine.**Fire Age** Old to Moderate.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: 1% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

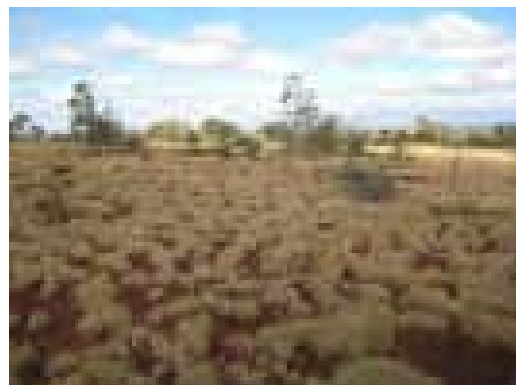
**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	1%		1.6 m	OP110.02 Flowering.
	<i>Acacia bivenosa</i>	1%		1.5 m	OP03.01
	<i>Acacia inaequilatera</i>	2%		1-3 m	OP49.03 Flowering.
	<i>Acacia pachyacra</i>	+		0.5 m	OP20.03
	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>	+		1 m	OP110.03
	<i>Corymbia hamersleyana</i>	+		5 m	OP11.09
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila exilifolia</i>	+		0.3 m	OP110.01
	<i>Eremophila longifolia</i>	+		1 m	OP09.02
	<i>Eucalyptus gamophylla</i>	1%		3 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		5 m	OP11.08
	<i>Gossypium robinsonii</i>	+		1.2 m	OP110.04
	<i>Hakea chordophylla</i>	1%		3 m	OP26.05
	<i>Keraudrenia nephrosperma</i>	+		0.3 m	OP22.14
	<i>Paraneurachne muelleri</i>	+		0.3 m	OP23.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	+		0.3 m	OP16.13
	<i>Scaevola spinescens</i>	+		0.3 m	OP110.05
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.3 m	OP05.08

Senna glutinosa subsp. glutinosa	+	1.5 m	OP42.03
Senna glutinosa subsp. pruinosa	+	1 m	OP28.01
Themeda triandra	+	0.3 m	OP15.16
Triodia pungens	2%	0.3 m	OP110.06
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40%	0.3 m	OP26.11

**Ophthalmia** Site OP111**Described by** CH **Date** 19/05/2010 **Type** Q

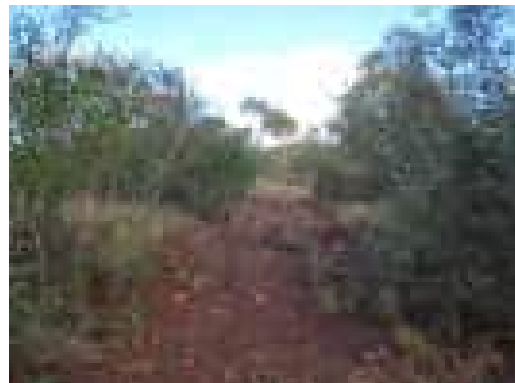
50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 745470 mE 7424490 mN**Habitat** Colluvial apron in foothills.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock GrasslandVegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia deserticola* subsp. *deserticola* with Open Shrubland of *Acacia inaequilatera* with Scattered Hummock Grasses of *Triodia pungens*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: South-west.  
Bare Ground: 50%.  
Litter Cover: 1% Logs, 3% Twigs, 1% Lvs.  
Disturbance: N/A.**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		1.8 m	OP95.02
	<i>Acacia bivenosa</i>	+		1 m	OP27.03
	<i>Acacia inaequilatera</i>	2%		1.5 m	OP06.04
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP02.08
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	2%		6 m	OP83.04
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	3%		8 m	OP31.04
	<i>Gossypium robinsonii</i>	+		2 m	OP91.02
	<i>Hakea chordophylla</i>	+		1.5 m	OP99.01
	<i>Ptilotus exaltatus</i>	+		0.7 m	OP04.15
	<i>Ptilotus rotundifolius</i>	+		0.5 m	OP83.02
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1 m	OP25.06
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.2 m	OP111.01
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		1.2 m	OP111.02
	<i>Triodia pungens</i>	1%		0.4 m	OP33.01 Flowering.
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	40%		0.2 m	OP02.14

**Ophthalmia**                      **Site** OP112  
**Described by** CS                      **Date** 19/05/2010 **Type** Q                      100 x 25 m

**Location** Ophthalmia.  
**MGA Zone** 50                      746108 **mE**                      7424272 **mN**  
**Habitat** Drainage line.  
**Soil** Red-brown clayey loam on banks with deep pebbles in the river bed.  
**Rock Type** Ironstone, quartz and marramamba.  
**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland



Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Open Tussock Grassland of *Themeda triandra* and *Paraneurachne muelleri* with Shrubland of *Dodonaea lanceolata* var. *lanceolata*, *Petalostylis labicheoides*, *Acacia monticola*, *Rulingia luteiflora*, *Acacia citrinoviridis*, *Santalum lanceolatum*, *Ptilotus obovatus* and *Acacia pyrifolia* with Very Open Hummock Grassland of *Triodia melvillei* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus xerothermica*.

**Veg Condition** Pristine.

**Fire Age** Old.

**Notes** Aspect: N/A.  
 Bare Ground: 60%.  
 Litter Cover: 1% Logs, 2% Twigs, 1% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01	
	<i>Acacia citrinoviridis</i>	5%		1 m	OP01.05	
	<i>Acacia monticola</i>	7%		2 m	OP52.03	
	<i>Acacia pyrifolia</i>	1%		1.5 m	NC	
	<i>Corymbia hamersleyana</i>	3%		5 m	OP11.09	
	<i>Cymbopogon ambiguus</i>	+		0.7 m	OP68.04	
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	10%		2 m	OP44.02	
	<i>Duperreya commixta</i>	+		CR	OP03.05	
	<i>Eucalyptus gamophylla</i>	+		2 m	NC	
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		3 m	OP11.08	
	<i>Eucalyptus xerothermica</i>	1%		4 m	OP09.03	
	<i>Gossypium robinsonii</i>	+		2 m	OP68.01	
	<i>Grevillea wickhamii</i>	+		2 m	NC	
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07	
	<i>Keraudrenia nephrosperma</i>	+		0.4 m	OP22.14	
	<i>Paraneurachne muelleri</i>	10%		0.4 m	OP35.07	Flowering.
	<i>Petalostylis labicheoides</i>	10%		2 m	OP12.01	
	<i>Ptilotus obovatus</i>	1%		0.8 m	OP15.08	



<i>Rhyncharrhena linearis</i>	+	CR	OP15.10
<i>Rulingia luteiflora</i>	5%	2 m	OP03.06
<i>Rutidosis helichrysoides</i>	+	0.4 m	OP35.06
<i>Santalum lanceolatum</i>	2%	1.5 m	OP41.05
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+	1 m	OP21.04
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	NC
<i>Themeda triandra</i>	20%	0.5 m	OP15.16
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	(+)	0.3 m	NC
<i>Triodia melvillei</i>	10%	0.5 m	OP01.11

**Ophthalmia** Site OP113**Described by** BW **Date** 19/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 743630 mE 7423374 mN**Habitat** Low hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Inronstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of

*Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gulliesVegetation Sub-Association: Low Open Woodland of *Acacia aneura* var. *aneura* and *Acacia pruinocarpa* with Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrubland of *Grevillea berryana*.**Veg Condition** Excellent.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 90%.

Litter Cover: &lt;1% Logs, 1% Twigs, 2% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	8%		4-6 m	OP97.02	
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1.6 m	OP113.05	
	<i>Acacia pruinocarpa</i>	4%		5 m	OP02.08	
	<i>Acacia tetragonophylla</i>	+		1 m	NC	
	<i>Dodonaea petiolaris</i>	+		1.3 m	OP113.03	
	<i>Duperreya commixta</i>	+		CL	OP02.02	
	<i>Eremophila forrestii</i> x <i>latrobei</i>	+		0.5 m	OP97.04	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		0.7 m	OP89.09	
	<i>Eremophila lanceolata</i>	+		0.7 m	OP113.07	
	<i>Eremophila longifolia</i>	+		0.6 m	OP85.05	
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		0.5 m	OP113.02	
	<i>Grevillea berryana</i>	3%		4 m	OP113.01	
	<i>Sclerolaena densiflora</i>	+		0.5 m	OP113.04	
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.7 m	OP113.06	
	<i>Solanum lasiophyllum</i>	+		0.3 m	NC	Within the same vegetation association (out of plot).
	<i>Triodia melvillei</i>	+		0.4 m	OP113.08	
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	7%		0.3 m	OP113.09	

**Ophthalmia**                      **Site**    OP114  
**Described by CS**    **Date** 20/05/2010 **Type** Q    100 x 25 m

**Location**    Ophthalmia.

**MGA Zone**    50                      738630 **mE**                      7422438 **mN**

**Habitat**        Minor drainage line and floodplain.

**Soil**            Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.

**Rock Type**    Ironstone and quartz.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*

sp. *Shovelanna Hill* (S. van Leeuwen 3835), *T. pungens*

and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A.*

*pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia*

*hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

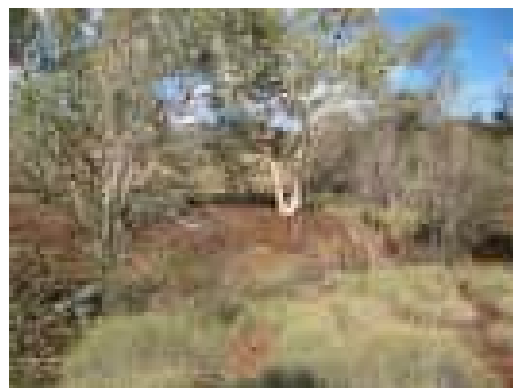
Vegetation Sub-Association: Open Hummock Grassland of *Triodia pungens* with Shrubland of

*Petalostylis labicheoides*, *Acacia tetragonophylla*, *Acacia maitlandii* and *Rulingia luteiflora* with Low

Open Woodland of *Eucalyptus repullulans* and *Eucalyptus leucophloia* subsp. *leucophloia* with High

Open Shrubland of *Acacia aneura* var. *intermedia* with Very Open Hummock Grassland of *Triodia*

*pungens* with Scattered Tussock Grasses of *Themeda triandra*.



**Veg Condition**    Pristine.

**Fire Age**        Moderate.

**Notes**            Aspect: South-west (slight).

Bare Ground: 75%.

Litter Cover: 5% Logs, 1% Twigs, 5% Lvs.

Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11
	<i>Acacia aneura</i> var. <i>intermedia</i>	2%		2-3.5 m	OP114.02
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		2 m	OP01.14
	<i>Acacia citrinoviridis</i>	+		3 m	OP01.05
	<i>Acacia kempeana</i>	+		1 m	OP11.06
	<i>Acacia maitlandii</i>	1%		1 m	OP22.13
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP05.09
	<i>Acacia tetragonophylla</i>	1%		1 m	OP03.11
	<i>Capparis lasiantha</i>	+		1 m	OP03.09
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		1 m	OP41.01
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP11.13
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		5 m	OP11.08
	<i>Eucalyptus repullulans</i>	2%		3 m	OP114.04
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2.5 m	OP10.38

<i>Hybanthus aurantiacus</i>	+	0.3 m	OP29.06
<i>Paraneurachne muelleri</i>	+	0.4 m	OP35.07
<i>Petalostylis labicheoides</i>	10%	1.5 m	OP12.01 Flowering.
<i>Psydrax suaveolens</i>	+	1 m	OP41.06
<i>Ptilotus obovatus</i>	+	0.6 m	OP15.08
<i>Rulingia luteiflora</i>	1%	1 m	OP03.06
<i>Santalum lanceolatum</i>	+	1.5 m	OP41.05
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	NC
<i>Themeda triandra</i>	1%	0.5 m	OP15.16
<i>Triodia pungens</i>	22%	0.5 m	OP114.01 Flowering.

**Ophthalmia**                      **Site** OP115  
**Described by** BW                      **Date** 20/05/2010 **Type** Q                      50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50                      729035 **mE**                      7422503 **mN**

**Habitat** Stony plain.

**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type** Ironstone and quartz (scattered).

**Vegetation** Broad Floristic Formation: *Triodia* Open Hummock Grassland



Vegetation Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) *T. melvillei* and *T. pungens* with Low Open Woodland of *Acacia aneura* var. *microcarpa*, *A. citrinoviridis* and *A. catenulata* subsp. *occidentalis* with Low Open Shrubland of *Eremophila forrestii*, *Acacia pruinocarpa* and *Sida ectogama* on Red-Brown Loam with a covering of cobbles and pebbles on Undulating Plains.

Vegetation Sub-Association: Low Open Woodland of *Acacia catenulata* subsp. *occidentalis* and *Acacia aneura* var. *microcarpa* with High Open Shrubland of *Acacia citrinoviridis* and *Grevillea berryana* with Very Open Hummock Grassland of *Triodia melvillei* with Scattered Low Shrubs of *Eremophila fraseri* subsp. *fraseri*.

**Veg Condition** Excellent.

**Fire Age** Old.

**Notes** Aspect: N/A.

Bare Ground: 95%.

Litter Cover: 1% Logs, 2% Twigs, 1% Lvs.

Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen	Notes
	<i>Acacia aneura</i> var. <i>microcarpa</i>	5%		5 m	OP115.01	
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	5%		5 m	OP115.03	
	<i>Acacia citrinoviridis</i>	6%		2.5-4 m	OP115.05	
	<i>Acacia dictyophleba</i>	+		1.5 m	OP59.16	
	<i>Acacia pruinocarpa</i>	+		0.4 m	OP02.08	
	<i>Acacia tetragonophylla</i>	+		1.2 m	NC	
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.7 m	OP97.11	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	1%		0.6 m	OP89.09	Flowering.
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	(+)		0.5 m	OP115.08	
	<i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>	+		2 m	OP115.10	
	<i>Grevillea berryana</i>	1%		2.5 m	OP115.06	
	<i>Keraudrenia nephrosperma</i>	+		0.4 m	OP115.04	
	<i>Psydrax latifolia</i>	+		1.5 m	OP89.03	
	<i>Ptilotus obovatus</i>	+		0.4 m	OP115.09	
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>	+		0.4 m	OP115.11	
	<i>Sida ectogama</i>	+		0.4 m	OP115.07	
	<i>Solanum lasiophyllum</i>	+		0.3 m	NC	
	<i>Tribulus suberosus</i>	+		0.4 m	NC	

*Triodia melvillei*

2%

0.3 m OP115.12

**Ophthalmia** Site OP116**Described by** CS **Date** 20/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 739104 mE 7421794 mN**Habitat** Rocky hilltop/ plateau.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia kempeana*, *Acacia bivenosa* and *Acacia ancistrocarpa* with Very Open Mallees of *Eucalyptus gamophylla* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 75%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	1%		1.5 m	OP11.02 Flowering.
	<i>Acacia bivenosa</i>	1%		2 m	OP03.01
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	+		1 m	OP01.14
	<i>Acacia kempeana</i>	5%		1.5 m	OP11.06
	<i>Acacia pachyacra</i>	+		1 m	OP23.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Codonocarpus cotinifolius</i>	+		2 m	OP17.06
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		4 m	OP05.01
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP11.13
	<i>Eucalyptus gamophylla</i>	2%		2.5 m	NC
	<i>Goodenia microptera</i>	+		0.4 m	OP52.04 Flowering.
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2 m	OP23.02
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18
	<i>Paraneurachne muelleri</i>	+		0.4 m	OP23.04
	<i>Rulingia loxophylla</i>	+		0.4 m	OP66.01
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		1 m	OP05.08

<i>Senna ferraria</i>	+	1.5 m	OP116.03
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	NC
<i>Triodia pungens</i>	5%	0.6 m	OP116.02
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	20%	0.4 m	OP116.01



**Ophthalmia**                      **Site**    OP117**Described by** BW                                      **Date** 20/05/2010 **Type** Q                                      80 x 30 m**Location**    Ophthalmia.**MGA Zone**    50                      727764 **mE**                      7421848 **mN****Habitat**        Low hill spur.**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens*and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A.**pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia**hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and

pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Scattered Hummock Grasses of *Triodia wiseana* with Scattered TussockGrasses of *Eriachne flaccida*.**Veg Condition**    Very Good**Fire Age**         Recent.**Notes**            Aspect: N/A.

Bare Ground: 97%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>intermedia</i>	+		1.6 m	OP117.02
	<i>Acacia bivenosa</i>	+		0.6 m	OP27.03
	<i>Acacia marramamba</i>	+		0.7 m	OP117.05
	<i>Acacia pruinocarpa</i>	+		0.3 m	OP02.08
	<i>Acacia sibilans</i>	+		0.8 m	OP117.09
	<i>Acacia sibirica</i>	+		1.2 m	OP117.03 Linear form.
	<i>Acacia tetragonophylla</i>	+		0.6 m	NC
	<i>Capparis lasiantha</i>	+		1.1 m	OP69.02
	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	+		0.6 m	OP115.08
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		0.5 m	OP117.07 Atypical.
	<i>Eriachne flaccida</i>	(1%)		0.1 m	OP117.08
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		5 m	OP57.06
	<i>Senna stricta</i>	+		0.4 m	OP117.04
	<i>Sida</i> sp. Pilbara (A.A. Mitchell PRP 1543)	+		0.4 m	OP117.01 ferrugeneous form
	<i>Triodia pungens</i>	+		0.3 m	OP117.06
	<i>Triodia wiseana</i>	1%		0.2 m	OP119.01

**Ophthalmia**                      **Site**    OP118  
**Described by**CS                      **Date** 20/05/2010 **Type** Q                      100 x 25 m

**Location**    Ophthalmia.

**MGA Zone**    50            738176 **mE**            7421623 **mN**

**Habitat**        Drainage line.

**Soil**            Red-brown clayey loam on banks with deep pebbles in the river bed.

**Rock Type**    Ironstone, quartz and marramamba.

**Vegetation**    Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: High Shrubland of *Petalostylis labicheoides* and *Acacia citrinoviridis* with Open Tussock Grassland of *Eulalia aurea*, *Themeda triandra* and *Chrysopogon fallax* with Open Shrubland of *Rulingia luteiflora*, *Acacia maitlandii*, *Acacia bivenosa* and *Senna stricta* with Very Open Hummock Grassland of *Triodia angusta* with Very Open Woodland of *Eucalyptus xerothermica*.



**Veg Condition**    Very Good.

**Fire Age**        Moderate.

**Notes**            Aspect: N/A.

Bare Ground: 70%.

Litter Cover: 10% Logs, 5% Twigs, 15% Lvs.

Disturbance: Cattle, horses and introduced species.

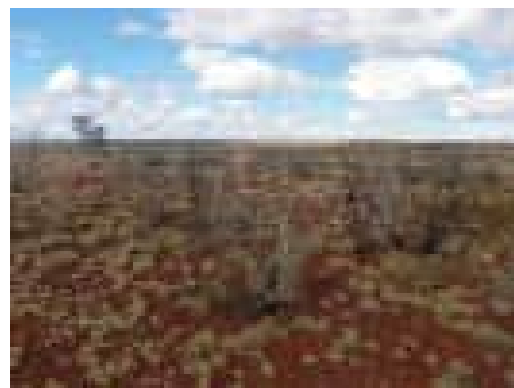
#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP11.11
	<i>Acacia bivenosa</i>	1%		1.5 m	OP03.01
	<i>Acacia citrinoviridis</i>	5%		1.5-3 m	OP118.07
	<i>Acacia maitlandii</i>	2%		1.5 m	OP22.13
	<i>Bidens bipinnata</i>	+		0.2 m	OP09.19
	<i>Chrysopogon fallax</i>	1%		0.4 m	OP15.20
	<i>Cleome viscosa</i>	+		0.4 m	OP35.01
	<i>Cymbopogon ambiguus</i>	+		0.8 m	OP68.04
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	1%		0.3 m	OP15.02
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1.5 m	OP44.02
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Enneapogon lindleyanus</i>	+		0.4 m	OP118.04
	<i>Eucalyptus xerothermica</i>	2%		4 m	OP09.03
	<i>Eulalia aurea</i>	10%		0.5 m	OP09.09
	<i>Euphorbia</i> ? <i>coghlanii</i>	+		0.2 m	OP35.10
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	+		0.4 m	OP09.05
	<i>Gastrolobium grandiflorum</i>				
	<i>Goodenia stellata</i>	+		0.1 m	OP118.02

<i>Gossypium sturtianum</i>	+	1.4 m	OP09.11
<i>Hakea lorea</i> subsp. <i>lorea</i>	+	3 m	OP10.38
<i>Hybanthus aurantiacus</i>	+	0.3 m	OP29.06
<i>Ipomoea muelleri</i>	+	CR	OP37.01
<i>Isotropis forrestii</i>	+	0.5 m	OP104.03
<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	CL	OP09.07
<i>Paraneurachne muelleri</i>	+	0.4 m	OP23.04
<i>Petalostylis labicheoides</i>	20%	2.5 m	OP12.01
<i>Pluchea dentex</i>	+	0.3 m	OP118.03
<i>Ptilotus obovatus</i>	+	0.5 m	OP15.08
<i>Rhynchosia minima</i>	+	CR	OP76.01
<i>Rulingia luteiflora</i>	2%	1.5 m	OP03.06
<i>Senna stricta</i>	1%	1.5 m	OP118.05
<i>Sida fibulifera</i>	+	CR	OP15.01
<i>Tephrosia rosea</i> var. <i>glabrior</i>	1%	0.4 m	OP50.02
<i>Themeda triandra</i>	5%	0.6 m	OP15.16
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	+	0.3 m	NC
<i>Triodia angusta</i>	5%	0.5 m	OP118.01
<i>Triodia pungens</i>	1%	0.5 m	OP118.06 Flowering.

**Ophthalmia** Site OP119**Described by** BW **Date** 20/05/2010 **Type** Q 50 x 50 m**Location** Ophthalmia.**MGA Zone** 50 728912 mE 7421892 mN**Habitat** Low hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronica*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia inaequilatera* with Low Open Shrubland of *Acacia ancistrocarpa* and *Acacia bivenosa*.

**Veg Condition** Very Good.**Fire Age** Young.

**Notes** Aspect: N/A.  
 Bare Ground: 85%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: Fire.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	1%		0.5 m	OP93.02
	<i>Acacia bivenosa</i>	1%		0.7 m	OP27.03
	<i>Acacia inaequilatera</i>	2%		0.5-1.5 m	OP93.01 Most <1 m.
	<i>Acacia kempeana</i>	+		0.5 m	OP119.03
	<i>Acacia tetragonophylla</i>	+		0.6 m	NC
	<i>Ptilotus obovatus</i>	+		0.3 m	OP105.02
	<i>Ptilotus rotundifolius</i>	+		0.4 m	NC
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		1.2 m	OP119.04
	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	+		1.2 m	OP119.02
	<i>Solanum lasiophyllum</i>	+		0.2 m	NC
	<i>Themeda triandra</i>	(+)		0.3 m	OP77.10
	<i>Triodia wiseana</i>	15%		0.2 m	OP119.01

**Ophthalmia**                      **Site**    OP120  
**Described by** EC                      **Date** 21/05/2010 **Type** Q                      50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50            731818    **mE**            7426223    **mN**

**Habitat**        Low footslope of large range.

**Soil**             Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Eucalyptus leucophloia* subsp. *leucophloia* with Open Shrubland of *Scaevola parvifolia* subsp. *pilbarae* and *Acacia adoxa* var. *adoxo* with Very Open Mallees of *Eucalyptus gamophylla* with Scattered Tall Shrubs of *Hakea chordophylla*.



**Veg Condition**    Pristine.

**Fire Age**        Young to Moderate.

**Notes**            Aspect: South.  
 Bare Ground: 65%.  
 Litter Cover: <1% Logs, 1% Twigs, 2% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	1%		0.3 m	OP26.04
	<i>Acacia bivenosa</i>	+		0.5 m	OP03.01
	<i>Acacia inaequilatera</i>	+		2.5 m	OP49.03
	<i>Acacia pachyacra</i>	+		0.8 m	OP20.03
	<i>Acacia paraneura</i>	+		0.3 m	OP26.02
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	+		0.3 m	OP20.04
	<i>Chrysocephalum pterochaetum</i>	+		0.3 m	OP120.07
	<i>Codonocarpus cotinifolius</i>	+		1.2 m	OP17.06
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	2%		2-4 m	OP05.01
	<i>Corymbia hamersleyana</i>	+		2.5 m	OP11.09
	<i>Cymbopogon obtectus</i>	+		0.3 m	OP20.02
	<i>Dampiera candidans</i>	+		0.3 m	OP120.04
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		0.5-1.5 m	OP120.01
	<i>Eucalyptus gamophylla</i>	2%		1-3.5 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		3 m	OP11.08
	<i>Hakea chordophylla</i>	1%		3.5 m	OP26.05
	<i>Heliotropium pachyphyllum</i>	+		0.3 m	OP120.06
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	+		0.3 m	OP120.02

<i>Jasminum didymum</i> subsp. <i>lineare</i>	+	0.3 m	OP09.07
<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+	03 m	OP03.18
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.4 m	OP03.08
<i>Ptilotus calostachyus</i>	+	0.3 m	NC
<i>Ptilotus rotundifolius</i>	+	0.4 m	OP21.03
<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	2%	0.3 m	OP16.13
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	1 m	OP28.01
<i>Sida arenicola</i>	+	0.7 m	OP120.03
<i>Solanum lasiophyllum</i>	+	0.3 m	OP10.13
<i>Triodia pungens</i>	+	0.3 m	OP120.05
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	45%	0.3 m	OP26.11

**Ophthalmia** Site OP121**Described by** CH **Date** 20/05/2010 **Type** Q

50 x 50 m

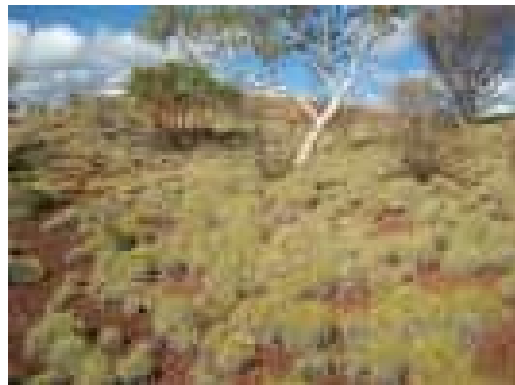
**Location** Ophthalmia.**MGA Zone** 50 732450 mE 7422410 mN**Habitat** Hillslope.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*

sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia wiseana* with Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia aneura* var. *aneura* with Low Open Shrubland of *Acacia synchronicia* and *Acacia aneura* var. *aneura*.

**Veg Condition** Pristine.**Fire Age** Moderate.

**Notes** Aspect: North.  
Bare Ground: 50%.  
Litter Cover: <1% Logs, 1% Twigs, <1% Lvs.  
Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	6%		1-5 m	OP25.07
	<i>Acacia pruinocarpa</i>	+		2 m	OP02.08
	<i>Acacia synchronicia</i>	3%		1 m	OP71.01
	<i>Acacia tetragonophylla</i>	+		2 m	OP25.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	6%		4-8 m	OP121.01
	<i>Maireana triptera</i>	+		0.2 m	OP25.10
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	45%		0.2 m	OP02.14
	<i>Triodia wiseana</i>	2%		0.4 m	OP25.04

**Ophthalmia** Site OP122**Described by EC** Date 20/05/2010 Type Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 736839 mE 7421271 mN**Habitat** Low hilltop.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* *brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills  
 Vegetation Sub-Association: Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*.

**Veg Condition** Pristine.**Fire Age** Moderate.

**Notes** Aspect: N/A.  
 Bare Ground: 65%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia synchronicia</i>	+		0.3 m	OP84.03
	<i>Acacia tetragonophylla</i>	+		0.3 m	OP03.11
	<i>Codonocarpus cotinifolius</i>	+		2 m	OP17.06
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.2 m	OP122.02
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1 m	OP122.01
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%		1-3 m	OP11.08
	<i>Grevillea berryana</i>	+		1 m	OP122.03
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.3 mc	NC
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1.5 m	OP42.03
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		0.3 mc	OP28.01
	<i>Solanum lasiophyllum</i>	+		0.3 m	OP10.13
	<i>Triodia</i> aff. <i>basedowii</i>	+		0.3 m	OP122.04



**Ophthalmia** Site OP123**Described by** CH **Date** 20/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 732335 mE 7421530 mN**Habitat** Plain.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gulliesVegetation Sub-Association: Hummock Grassland of *Triodia angusta* with High Shrubland of *Acacia sibilans* and *Acacia catenulata* subsp. *occidentalis* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Shrubs of *Acacia tetragonophylla*.**Veg Condition** Pristine.**Fire Age** Very Old.**Notes** Aspect: N/A.

Bare Ground: 55%.

Litter Cover: &lt;1% Logs, 5% Twigs, &lt;1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	+		1 m	OP25.07
	<i>Acacia bivenosa</i>	+		1 m	OP27.03
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	2%		5 m	OP25.08
	<i>Acacia pruinocarpa</i>	+		2 m	OP02.08
	<i>Acacia sibilans</i>	10%		4.5 m	OP123.01 Flowering.
	<i>Acacia synchronicia</i>	+		1.2 m	OP71.01
	<i>Acacia tetragonophylla</i>	1%		1.5 m	OP25.02
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1 m	OP08.07
	<i>Eremophila cuneifolia</i>	+		0.5 m	OP125.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		5 m	OP121.01
	<i>Ptilotus calostachyus</i>	+		0.5 m	OP02.07
	<i>Senna glaucifolia</i>	+		1 m	OP95.03
	<i>Triodia angusta</i>	35%		0.7 m	OP55.06

**Ophthalmia**                      **Site** OP124  
**Described by EC**                      **Date** 20/05/2010 **Type** Q                      50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50                      736053 **mE**                      7421515 **mN**

**Habitat** Low rocky hill.

**Soil** Red-brown skeletal loam with cobbles and pebbles covering the soil surface. Large area of exposed bedrock and boulders also present.

**Rock Type** Dolerite and quartz.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of

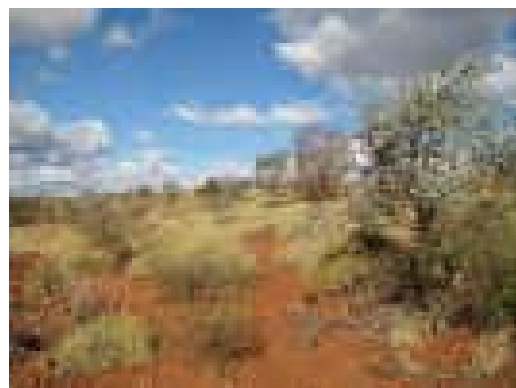
*Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Open Tussock Grassland of *Cymbopogon ambiguus* with Open Shrubland of *Acacia inaequilatera*, *Acacia tetragonophylla* and *Acacia kempeana* with Very Open Hummock Grassland of *Triodia wiseana* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with High Open Shrubland of *Acacia aneura* var. *microcarpa* and *Acacia pruinocarpa*.

**Veg Condition** Pristine.

**Fire Age** Old.

**Notes** Aspect: North-west.  
 Bare Ground: 70%.  
 Litter Cover: <1% Logs, <1% Twigs, 1% Lvs.  
 Disturbance: N/A.  
 Notes: Cattle tracks on surrounding plains.



#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	+		1 m	OP11.02
	<i>Acacia aneura</i> var. <i>microcarpa</i>	1%		4 m	OP124.07
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia citrinoviridis</i>	+		1 m	OP01.05
	<i>Acacia dictyophleba</i>	+		2 m	OP124.05
	<i>Acacia inaequilatera</i>	2%		1-3 m	OP49.03
	<i>Acacia kempeana</i>	1%		0.3-2 m	OP124.04
	<i>Acacia pruinocarpa</i>	1%		3 m	OP05.09
	<i>Acacia tetragonophylla</i>	1%		0.5-1.5 m	OP03.11
	<i>Amphipogon sericeus</i> (Newman form BR2-21)	+		0.3 m	OP20.04
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.4 m	OP49.04
	<i>Corymbia hamersleyana</i>	1%		2 m	OP11.09
	<i>Cymbopogon ambiguus</i>	15%		0.4 m	OP124.08
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Enneapogon caerulescens</i>	+		0.2 m	OP124.03

<i>Eremophila longifolia</i>	+	0.5 m	OP09.02
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%	4 m	OP11.08
<i>Hakea chordophylla</i>	+	1 m	OP26.05
<i>Hibiscus haynaldii</i>	+	0.5 m	OP124.02
<i>Paraneurachne muelleri</i>	+	0.3 m	OP23.04
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	0.4 m	OP03.08
<i>Santalum lanceolatum</i>	+	2.5 m	OP124.06
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+	0.3 m	OP05.08
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1 m	OP42.03
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	0.3 m	OP28.01
<i>Sida</i> sp.	+	0.3 m	OP124.01 inadequate
<i>Streptoglossa bubakii</i>	+	0.5 m	OP128.08
<i>Tribulus suberosus</i>	+	0.5 m	OP01.09
<i>Triodia wiseana</i>	2%	0.3 m	OP124.09

**Ophthalmia**                      **Site**    OP125  
**Described by** CH                                      **Date** 20/05/2010 **Type** Q                                      50 x 50 m

**Location**    Ophthalmia.

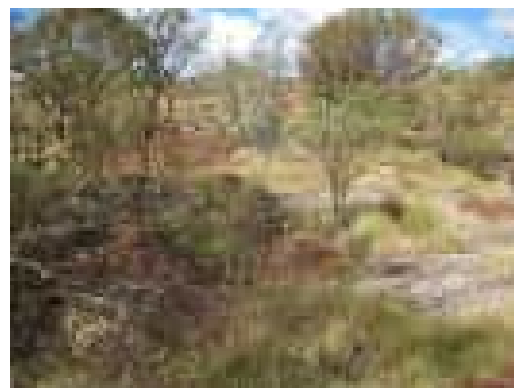
**MGA Zone**    50            731565 **mE**            7422340 **mN**

**Habitat**       Slopes of valley.

**Soil**            Red-brown loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia angusta* and *Triodia pungens* with Low Open Woodland of *Acacia aneura* var. *aneura* with High Open Shrubland of *Acacia catenulata* subsp. *occidentalis* and *Acacia tetragonophylla* with Open Shrubland of *Tribulus suberosus* and *Solanum orbiculatum* subsp. *orbiculatum* with Scattered Low Shrubs of *Eremophila cuneifolia*.



**Veg Condition** Excellent.

**Fire Age**       Moderate.

**Notes**           Aspect: North.  
 Bare Ground: 70%.  
 Litter Cover: 5% Logs, 5% Twigs, 1% Lvs.  
 Disturbance: N/A.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	10%		5 m	OP25.07
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	5%		4 m	OP25.08
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP02.08
	<i>Acacia tetragonophylla</i>	1%		3 m	OP25.02
	<i>Eremophila cuneifolia</i>	1%		0.3 m	OP125.02
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		1.8 m	OP67.11
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	+		1.7 m	OP125.04
	<i>Hibiscus haynaldii</i>	+		0.5 m	OP125.03
	<i>Maireana triptera</i>	+		0.2 m	OP25.10
	<i>Psydrax latifolia</i>	+		0.5 m	OP25.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Santalum lanceolatum</i>	+		1.8 m	OP04.20
	<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	1%		1 m	OP125.01
	<i>Tribulus suberosus</i>	5%		2 m	OP25.05
	<i>Triodia angusta</i>	25%		0.4 m	OP55.06
	<i>Triodia pungens</i>	5%		0.4 m	OP33.01

**Ophthalmia** Site OP126**Described by**CS **Date** 20/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 736371 mE 7422714 mN**Habitat** Upper rocky hillslope.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

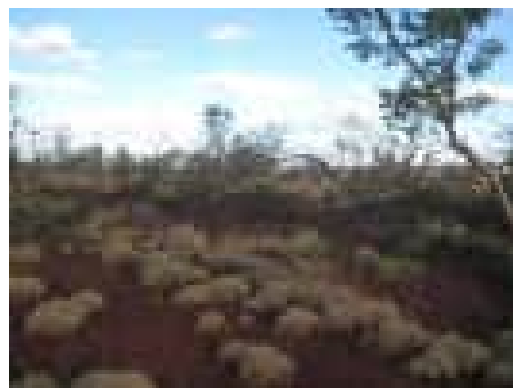
Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens*and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gulliesVegetation Sub-Association: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Low Open Shrubland of *Eremophila exilifolia* with Open Shrubland of *Acacia aneura* var. *aneura* and *Acacia kempeana*.**Veg Condition** Excellent.**Fire Age** Moderate.**Notes** Aspect: South-west.

Bare Ground: 75%.

Litter Cover: &lt;1% Logs, 1% Twigs, 1% Lvs.

Disturbance: Old track nearby.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	1%		1 m	OP11.11
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01
	<i>Acacia kempeana</i>	1%		1 m	OP11.06
	<i>Acacia pruinocarpa</i>	+		1 m	OP05.09
	<i>Acacia rhodophloia</i>	+		1 m	OP126.03
	<i>Codonocarpus cotinifolius</i>	+		2 m	OP17.06
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	+		3 m	OP05.01
	<i>Eremophila exilifolia</i>	2%		0.6 m	OP126.01
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	+		0.8 m	OP126.02
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		0.4 m	OP13.03
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		0.5 m	OP11.13
	<i>Eucalyptus gamophylla</i>	+		3 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		5 m	OP11.08
	<i>Gossypium robinsonii</i>	+		2 m	OP68.01
	<i>Grevillea berryana</i>	+		1.5 m	OP01.13
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	+		0.5 m	OP03.18
	<i>Rulingia luteiflora</i>	+		1.5 m	OP03.06
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP126.04

<i>Senna stricta</i>	+	0.8 m	OP03.13
<i>Solanum lasiophyllum</i>	+	0.3 m	OP19.06
<i>Triodia pungens</i>	2%	0.6 m	OP116.02
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	25%	0.3 m	OP116.01

**Ophthalmia**                      **Site**    OP127

**Described by** CH    **Date** 20/05/2010 **Type** Q    100 x 20 m

**Location**    Ophthalmia.

**MGA Zone**    50                      731433 mE                      7420728 mN

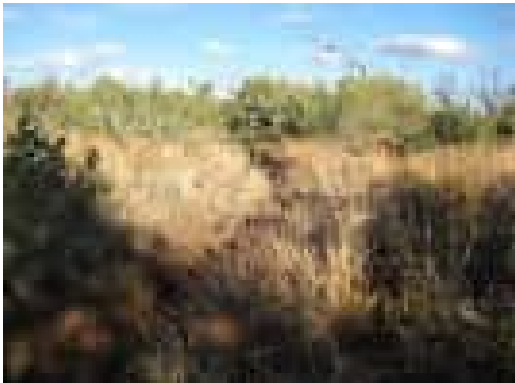
**Habitat**        Creekline.

**Soil**             Red-brown silty loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills. Vegetation Sub-Association: Low Open Heath of *Themeda triandra* with Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Open Shrubland of *Gossypium sturtianum*.



**Veg Condition**    Excellent.

**Fire Age**         Old.

**Notes**            Aspect: N/A.  
 Bare Ground: 30%.  
 Litter Cover: <1% Logs, 1% Twigs, 1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	25%		2-8 m	OP127.01
	<i>Gossypium sturtianum</i>	10%		1.5 m	OP51.02
	<i>Themeda triandra</i>	70%		0.8 m	OP04.18

**Ophthalmia** Site OP128**Described by EC** Date 20/05/2010 **Type Q**

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 737562 **mE** 7421891 **mN****Habitat** Undulating plain.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

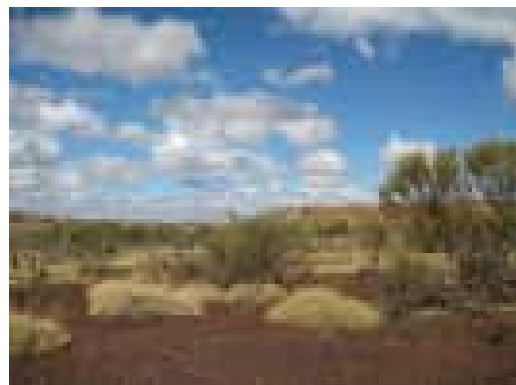
Grassland

Vegetation Association: Hummock Grassland of *Triodia**wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills.Vegetation Sub-Association: Very Open Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia aneura* var. *microcarpa*, *Eremophila jucunda* subsp. *pulcherrima* and *Acacia tetragonophylla* with Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica* with Scattered Low Shrubs of *Scaevola spinescens*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 80%.

Litter Cover: 1% Logs, 2% Twigs, 5% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		0.3 m	OP03.16
	<i>Acacia aneura</i> var. <i>microcarpa</i>	2%		1-3 m	OP128.01
	<i>Acacia synchronicia</i>	+		2 m	OP128.03
	<i>Acacia tetragonophylla</i>	1%		1-1.6 m	OP03.11
	<i>Aristida</i> sp.	+		0.3 m	OP128.09 inadequate
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	1%		0.5-1.2 m	OP128.04
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	+		0.5 m	OP128.10
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	2%		2-3.5 m	OP03.03
	<i>Hakea preissii</i>	1%		2.5 m	OP128.02
	<i>Maireana triptera</i>	+		0.3 m	OP128.11
	<i>Ptilotus exaltatus</i>	+		0.1 m	NC
	<i>Scaevola spinescens</i>	1%		0.5-1 m	OP128.05
	<i>Sclerolaena densiflora</i>	+		0.5 m	OP128.06
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	+		0.3 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		0.3 m	OP03.10
	<i>Sida fibulifera</i>	+		0.2 m	OP128.07
	<i>Streptoglossa bubakii</i>	+		0.2 m	OP128.08
	<i>Triodia brizoides</i>	10%		0.3 m	OP128.12

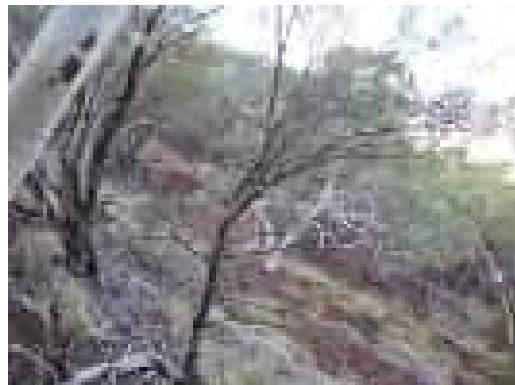


**Ophthalmia**                      **Site**    OP129**Described by** CH    **Date** 21/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50                      733625    **mE**                      7426200    **mN****Habitat**       Steep breakaway/ scree slope.**Soil**            Red-brown loam with cobbles and pebbles covering the soil surface. Some exposed bedrock.**Rock Type**    Ironstone.**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia**wiseana*, *T. brizoides* and *T. pungens* with Low Woodland of *Eucalyptus leucophloia* subsp.*leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Acacia citrinoviridis* with Low OpenShrubland of *Scaevola browniana* subsp. *browniana*, *Eremophila jucunda* subsp. *pulcherrima* and *Keraudrenia nephrosperma* on Red-brown loam on steep hill slopesVegetation Sub-Association: Low Open Forest of *Acacia citrinoviridis* and *Eucalyptus leucophloia* subsp. *leucophloia* with Hummock Grassland of *Triodia brizoides* and *Triodia pungens* with Open Shrubland of *Scaevola browniana* subsp. *browniana*.**Veg Condition**    Pristine.**Fire Age**        Very Old.**Notes**            Aspect: South.

Bare Ground: 45%.

Litter Cover: 1% Logs, 5% Twigs, 10% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia citrinoviridis</i>	60%		6 m	OP129.03
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	+		0.1 m	OP129.05
	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	+		1 m	OP129.07
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.6 m	OP129.06
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	10%		7 m	OP31.04
	<i>Prostanthera albiflora</i>	+		0.4 m	OP129.02
	<i>Psyrax latifolia</i>	+		1 m	OP25.01
	<i>Scaevola browniana</i> subsp. <i>browniana</i>	5%		1.5 m	OP129.04
	<i>Triodia brizoides</i>	40%		0.3 m	OP129.01
	<i>Triodia pungens</i>	2%		0.4 m	OP33.01

**Ophthalmia**                      **Site** OP130  
**Described by** CS                      **Date** 21/05/2010 **Type** Q                      50 x 50 m

**Location** Ophthalmia.

**MGA Zone** 50                      732478 **mE**                      7425997 **mN**

**Habitat** Lower footslope to range.

**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.

**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia*

*ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills

Vegetation Sub-Association: Open Hummock Grassland of *Triodia* aff. *basedowii* and *Triodia pungens* with Very Open Mallees of *Eucalyptus gamophylla* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola* with Scattered Tall Shrubs of *Acacia inaequilatera*.



**Veg Condition** Pristine.

**Fire Age** Old.

**Notes** Aspect: South.  
 Bare Ground: 69%.  
 Litter Cover: <1% Logs, 2% Twigs, <1% Lvs.  
 Disturbance: N/A.  
 Notes: Many dead shrubs (2%, 0.5-1 m)

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adoxa</i> var. <i>adoxo</i>	+		0.4 m	OP52.05
	<i>Acacia bivenosa</i>	+		1.5 m	OP03.01
	<i>Acacia hilliana</i>	+		0.4 m	NC
	<i>Acacia inaequilatera</i>	1%		2.5 m	OP49.03
	<i>Acacia trudgeniana</i>	+		1 m	OP130.01
	<i>Chrysocephalum pterochaetum</i>	+		0.4 m	OP130.04
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		4 m	OP05.01
	<i>Cymbopogon obtectus</i>	(+)		0.8 m	OP23.03
	<i>Diplopeltis stuartii</i> var. <i>stuartii</i>				OP130.10 Within the same vegetation association (out of plot).
	<i>Eucalyptus gamophylla</i>	2%		2 m	NC
	<i>Goodenia microptera</i>	+		0.3 m	OP52.04
	<i>Goodenia stobbsiana</i>	(+)		0.3 m	NC
	<i>Goodenia triodiophila</i>	+		0.2 m	OP130.02 5 individuals.
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2.5 m	OP23.02
	<i>Hibiscus sturtii</i> var. ? <i>campylochlamys</i>	+		0.3 m	OP21.05
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		CL	OP09.07 Flowering.

<i>Keraudrenia nephrosperma</i>	+	0.4 m	OP22.14
<i>Maireana georgei</i>			
<i>Paraneurachne muelleri</i>	+	0.4 m	OP23.04 Flowering.
<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+	1 m	OP03.08
<i>Ptilotus calostachyus</i>	(+)	0.4 m	OP46.02
<i>Rhagodia eremaea</i>	+	0.4 m	OP130.08
<i>Senna glaucifolia</i>	+	2 m	OP36.06
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+	1.5 m	NC
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+	1.5 m	OP78.02
<i>Solanum centrale</i>	+	0.3 m	OP130.07
<i>Solanum lasiophyllum</i>	+	0.5 m	OP19.06 Flowering.
<i>Tephrosia</i> sp. Cathedral Gorge (F.H. Mollemans 2420)	+	0.3 m	OP130.09
<i>Themeda triandra</i>	+	0.4 m	OP15.16
<i>Triodia</i> aff. <i>basedowii</i>	30%	0.3 m	OP130.05
<i>Triodia pungens</i>	1%	0.6 m	OP130.06 Flowering.

**Ophthalmia**                      **Site**    OP131  
**Described by** BW                                      **Date** 21/05/2010 **Type** Q                                      50 x 50 m

**Location**    Ophthalmia.

**MGA Zone**    50                      733302 **mE**                      7425979 **mN**

**Habitat**        Steep hill slope.

**Soil**             Red-brown loam with cobbles and pebbles on the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of

*Triodia wiseana*, *T. brizoides* and *T. pungens* with Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Acacia citrinoviridis* with Low Open Shrubland of *Scaevola browniana* subsp. *browniana*, *Eremophila jucunda* subsp. *pulcherrima* and *Keraudrenia nephrosperma* on Red-brown loam on steep hill slopes

Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Low Shrubland of *Mirbelia viminalis* and *Keraudrenia nephrosperma* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Shrubs of *Acacia hamersleyensis*.



**Veg Condition**    Excellent.

**Fire Age**        Moderate.

**Notes**            Aspect: South.

Bare Ground: 20%.

Litter Cover: <1% Logs, <1% Twigs, 1% Lvs.

Disturbance: N/A.

Notes: Recent fire scar to the west of the site.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03
	<i>Acacia hamersleyensis</i>	1%		1.4 m	OP131.03
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	2%		4 m	NC
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	+		0.6 m	OP131.04
	<i>Eriachne helmsii</i>	+		0.2 m	OP131.05
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		5 m	OP57.06
	<i>Hakea chordophylla</i>	+		1.6 m	NC
	<i>Keraudrenia nephrosperma</i>	4%		0.5 m	OP02.01
	<i>Mirbelia viminalis</i>	15%		0.5 m	OP131.02
	<i>Ptilotus rotundifolius</i>	+		0.8 m	NC
	<i>Scaevola browniana</i> subsp. <i>browniana</i>	+		0.2 m	OP131.07
	<i>Senna ferraria</i> x <i>glaucofolia</i>	+		2.2 m	OP131.06
	<i>Triodia pungens</i>	5%		0.4 m	OP131.01
	<i>Triodia wiseana</i>	45%		0.3 m	OP119.01

**Ophthalmia** Site OP132**Described by** CS **Date** 21/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 743277 mE 7422802 mN**Habitat** Rocky hillside.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia**catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of*Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura*

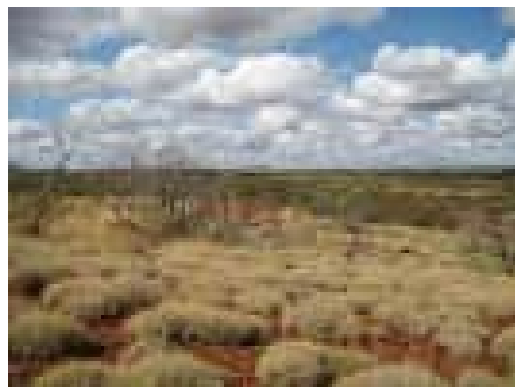
on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen3835) and *Triodia pungens* with Open Shrubland of *Acacia pruinocarpa* and *Acacia rhodophloia* withScattered Low Shrubs of *Eremophila platycalyx* subsp. *pardalota* with Scattered Tussock Grasses of*Eriachne lanata*.**Veg Condition** Excellent.**Fire Age** Old.**Notes** Aspect: South-west.

Bare Ground: 63%.

Litter Cover: &lt;1% Logs, 1% Twigs, &lt;1% Lvs.

Disturbance: Track nearby.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia citrinoviridis</i>	+		1.5 m	OP01.05
	<i>Acacia pruinocarpa</i>	2%		1.5 m	OP05.09
	<i>Acacia rhodophloia</i>	1%		1 m	OP132.03
	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>	+		1.5 m	OP132.04
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	+		1 m	OP41.01
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	1%		0.9 m	OP11.13
	<i>Eriachne lanata</i>	1%		0.3 m	OP132.05
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		2.5 m	OP11.08
	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	(+)		0.5 m	OP132.06
	<i>Grevillea berryana</i>	+		1 m	OP01.13
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		2 m	OP23.02
	<i>Psydrax latifolia</i>	+		0.6 m	OP10.12
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP03.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	NC
	<i>Triodia pungens</i>	2%		0.5 m	OP132.02
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	35%		0.4 m	OP132.01

**Ophthalmia** Site OP133**Described by** CH **Date** 21/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 739600 mE 7422800 mN**Habitat** Rocky plain.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hillsVegetation Sub-Association: Hummock Grassland of *Triodia sp.* Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Shrubland of *Acacia adsurgens* and *Acacia ancistrocarpa* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola* with Scattered Low Shrubs of *Rulingia loxophylla*.**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 45%.

Litter Cover: &lt;1% Logs, 1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	10%		1.8 m	OP95.02
	<i>Acacia ancistrocarpa</i>	5%		1.5 m	OP08.01
	<i>Acacia aneura</i> var. <i>aneura</i>	+		2 m	OP25.07
	<i>Acacia pruinocarpa</i>	+		1 m	OP02.08
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	1%		5 m	OP83.04
	<i>Eucalyptus gamophylla</i>	+		4 m	OP02.21
	<i>Hakea chordophylla</i>	+		1.5 m	OP99.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.6 m	OP71.03
	<i>Rulingia loxophylla</i>	1%		0.2 m	OP133.01
	<i>Triodia pungens</i>	2%		0.3 m	OP33.01
	<i>Triodia sp.</i> Shovelanna Hill (S. van Leeuwen 3835)	40%		0.2 m	OP02.14

**Ophthalmia** Site OP134**Described by** CS **Date** 21/05/2010 **Type** Q 50 x 50 m**Location** Ophthalmia.**MGA Zone** 50 736771 mE 7423676 mN**Habitat** Low rocky hills and slopes.**Soil** Red-brown loam with cobbles and pebbles scattered on the soil surface.**Rock Type** Ironstone, quartz and calcrete.**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland

Vegetation Association: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia synchronicia*, *A. bivenosa* and *A. tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *E. socialis* subsp. *eucentrica* and *E. repullulans* on Red-brown loam on low hills.

Vegetation Sub-Association: Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* with Scattered Low Shrubs of *Senna artemisioides* subsp. *helmsii*.

**Veg Condition** Pristine.**Fire Age** Old.

**Notes** Aspect: North.  
 Bare Ground: 68%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1 m	OP03.01
	<i>Acacia inaequilatera</i>	2%		2.5 m	OP49.03
	<i>Acacia kempeana</i>	+		1 m	OP11.06
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP05.09
	<i>Acacia synchronicia</i>	+		0.5 m	OP11.01
	<i>Acacia tetragonophylla</i>	+		1 m	OP03.11
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.6 m	OP49.04
	<i>Corymbia hamersleyana</i>				NC Recorded in adjacent minor drainage line.
	<i>Hakea lorea</i> subsp. <i>lorea</i>	+		3 m	OP23.02
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		1 m	OP03.08
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	1%		0.6 m	OP05.08
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	+		1 m	OP03.07
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	+		1 m	OP78.02
	<i>Solanum lasiophyllum</i>	+		0.4 m	OP19.06
	<i>Triodia wiseana</i>	32%		0.3 m	OP134.01

**Ophthalmia**                      **Site** OP135  
**Described by** BW                      **Date** 21/05/2010 **Type** Q                      100 x 10 m

**Location** Ophthalmia.

**MGA Zone** 50                      740238 **mE**                      7422791 **mN**

**Habitat** Drainage line.

**Soil** Red-brown clayey loam with cobbles and pebbles covering the soil surface.

**Rock Type** Ironstone.

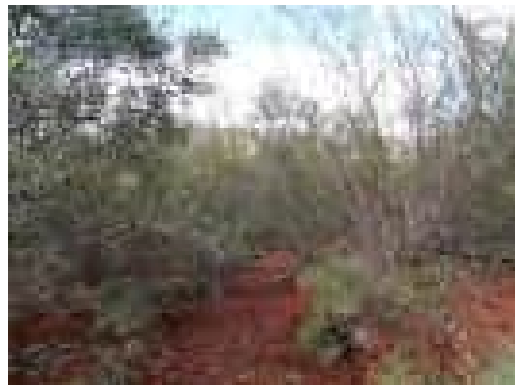
**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*

sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura* on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Open Scrub of *Petalostylis labicheoides* and *Acacia citrinoviridis* with Open Hummock Grassland of *Triodia pungens* with Low Open Shrubland of *Rulingia luteiflora* and *Keraudrenia nephrosperma* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana*.



**Veg Condition** Excellent.

**Fire Age** Moderate to Old.

**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: 1% Logs, 3% Twigs, 3% Lvs.

Disturbance: Flooding.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	+		1.3 m	OP135.02
	<i>Acacia bivenosa</i>	+		1.5 m	OP27.03
	<i>Acacia citrinoviridis</i>	30%		2.5 m	OP107.02
	<i>Acacia pruinocarpa</i>	+		0.5 m	OP02.08
	<i>Corymbia hamersleyana</i>	1%		5 m	NC
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	3%		5 m	OP57.06
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.4 m	OP09.07
	<i>Keraudrenia nephrosperma</i>	3%		0.4 m	OP02.01
	<i>Petalostylis labicheoides</i>	30%		3 m	OP04.17
	<i>Psyrdrax latifolia</i>	+		0.5 m	OP89.03
	<i>Rulingia luteiflora</i>	5%		0.6 m	OP02.16
	<i>Triodia pungens</i>	25%		0.4 m	OP135.01



**Ophthalmia** Site OP136**Described by EC** Date 21/05/2010 **Type Q**

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 737742 mE 7423711 mN**Habitat** Undulating plain between low hills/small valley.**Soil** Brown loam with cobbles and pebbles covering the soil surface. Areas of salmon clayey loam in depressions.**Rock Type** Ironstone and quartz.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

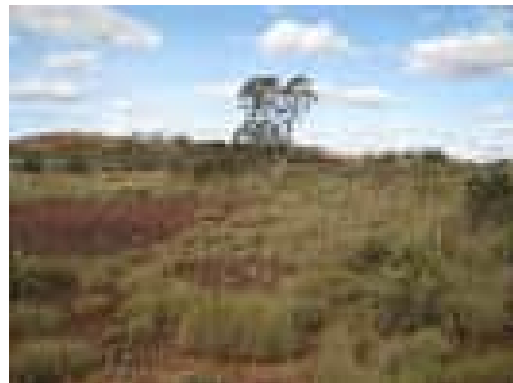
Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. angusta* and *T. brizoides* with Open Mallees of *Eucalyptus socialis* subsp. *eucentrica*, *E. trivalva* and *E. repullulans* with Open Shrubland of *Melaleuca eleuterostachya*, *Acacia bivenosa* and *A. synchronicia* on Red-brown loam with a covering of cobbles and pebbles on Low undulating hills. Vegetation Sub-Association: Hummock Grassland of *Triodia angusta* with Very Open Mallees of *Eucalyptus trivalva* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*.

**Veg Condition** Pristine.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 60%.

Litter Cover: &lt;1% Logs, &lt;1% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia bivenosa</i>	+		1.2-2 m	OP03.01
	<i>Acacia synchronicia</i>	+		0.2 m	OP84.03
	<i>Capparis lasiantha</i>	+		0.5 m	OP03.09
	<i>Eucalyptus gamophylla</i>	+		1.5 m	NC
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2%		2-6 m	OP11.08
	<i>Eucalyptus trivalva</i>	5%		1-3 m	OP136.03
	<i>Maireana triptera</i>	+		0.3 m	OP136.01
	<i>Melaleuca eleuterostachya</i>	+		0.8 m	OP07.01
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.2 m	OP03.08
	<i>Triodia angusta</i>	40%		0.2 m	OP136.02

**Ophthalmia**                      **Site**    OP137**Described by** CH**Date** 21/05/2010 **Type** Q

50 x 50 m

**Location**    Ophthalmia.**MGA Zone**    50            740315    **mE**            7421870    **mN****Habitat**        Raised stony plain.**Soil**            Red-brown loam with cobbles and pebbles covering of the soil surface.**Rock Type**    Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
 Vegetation Sub-Association: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia adsurgens* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola*.

**Veg Condition** Pristine.**Fire Age**        Moderate.**Notes**            Aspect: N/A.

Bare Ground: 45%.

Litter Cover: &lt;1% Logs, 2% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia adsurgens</i>	5%		1.2 m	OP95.02
	<i>Acacia kempeana</i>	+		1.8 m	OP137.01
	<i>Acacia pruinocarpa</i>	+		1.5 m	OP02.08
	<i>Codonocarpus cotinifolius</i>	+		3 m	OP02.13
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	2%		8 m	OP83.04
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		2.5 m	OP31.04
	<i>Hakea chordophylla</i>	+		1.5 m	OP99.01
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	+		0.4 m	OP67.04
	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	+		0.5 m	OP71.03
	<i>Rulingia loxophylla</i>	+		0.2 m	OP133.01
	<i>Triodia pungens</i>	5%		0.3 m	OP33.01
	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	40%		0.2 m	OP02.14

**Ophthalmia** Site OP139**Described by** CH **Date** 21/05/2010 **Type** Q

80 x 30 m

**Location** Ophthalmia.**MGA Zone** 50 740960 mE 7421876 mN**Habitat** Major drainage line and banks.**Soil** Red-brown loam on the banks with cobbles and pebbles on the river bed.**Rock Type** Ironstone and dolerite.**Vegetation** Broad Floristic Formation: *Themeda* Tussock Grassland

Vegetation Association: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon fallax* with Open Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* and *A. citrinoviridis* with Scattered Low Trees of *Eucalyptus xerothermica* and *E. victrix* on Red-brown clayey loam in drainage lines.

Vegetation Sub-Association: Low Woodland of *Acacia citrinoviridis* and *Eucalyptus victrix* with Very Open Hummock Grassland of *Triodia pungens* with Open Shrubland of *Rulingia luteiflora*, *Acacia maitlandii* and *Petalostylis labicheoides* with Low Open Woodland of *Eucalyptus victrix* with Very Open Tussock Grassland of *Cymbopogon ambiguus* and *Eriachne tenuiculmis*.

**Veg Condition** Excellent.**Fire Age** Moderate.**Notes** Aspect: N/A.

Bare Ground: 50%.

Litter Cover: 2% Logs, 10% Twigs, 5% Lvs.

Disturbance: Cattle.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia citrinoviridis</i>	12%		7 m	OP139.03
	<i>Acacia maitlandii</i>	1%		1.2 m	OP51.03
	<i>Bidens bipinnata</i>	+		0.1 m	OP139.01
	<i>Bulbostylis barbata</i>	+		0.1 m	OP139.13
	<i>Cleome viscosa</i>	+		0.1 m	OP139.14
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	+		0.2 m	OP139.06
	<i>Cymbopogon ambiguus</i>	2%		0.3 m	OP139.05
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	+		0.2 m	OP139.12
	<i>Duperreya commixta</i>	+		CL	OP02.02
	<i>Eriachne tenuiculmis</i>	1%		0.2 m	OP139.09
	<i>Eucalyptus victrix</i>	3%		9 m	OP139.02
	<i>Gossypium robinsonii</i>	+		0.5 m	OP139.07
	<i>Hybanthus aurantiacus</i>	+		0.1 m	OP139.04
	<i>Indigofera georgei</i>	+		0.3 m	OP139.11
	<i>Petalostylis labicheoides</i>	1%		1.6 m	OP04.17
	<i>Polycarpaea longiflora</i>	+		0.1 m	OP139.08
	<i>Ptilotus exaltatus</i>	+		0.4 m	OP04.15
	<i>Ptilotus obovatus</i>	+		0.3 m	OP139.10
	<i>Rhagodia eremaea</i>	+		0.3 m	OP109.05
	<i>Rulingia luteiflora</i>	2%		1.5 m	OP02.16

<i>Salsola tragus</i> subsp. <i>grandiflora</i>	+	0.1 m	OP04.05
<i>Senna stricta</i>	+	0.6 m	OP25.09
<i>Triodia pungens</i>	10%	0.3 m	OP33.01

**Ophthalmia** Site OP141**Described by** BW **Date** 21/05/2010 **Type** Q

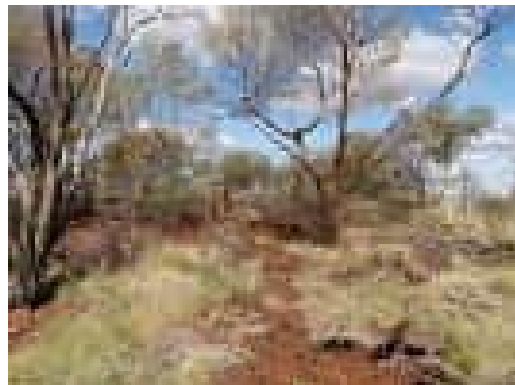
50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 741833 mE 7421921 mN**Habitat** Hilltop plateau.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.**Vegetation** Broad Floristic Formation: *Triodia* Hummock

Grassland

Vegetation Association: Hummock Grassland of *Triodia*sp. Shovelanna Hill (S. van Leeuwen 3835), *T. pungens* and *T. wiseana* with Tall Shrubland of *Acacia**catenulata* subsp. *occidentalis*, *A. citrinoviridis* and *A. pruinocarpa* with Low Open Woodlands of*Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Acacia aneura* var. *aneura*

on Red-brown loam with a covering of cobbles and pebbles on sloping hills and drainage gullies

Vegetation Sub-Association: Low Shrubland of *Eremophila exilifolia*, *Eremophila forrestii* subsp.*forrestii* and *Eremophila latrobei* subsp. *glabra* with Low Open Woodland of *Acacia aneura* var.*aneura*, *Grevillea berryana* and *Eucalyptus leucophloia* subsp. *leucophloia* with Very Open HummockGrassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High OpenShrubland of *Acacia tetragonophylla*, *Acacia ayersiana* and *Acacia rhodophloia*.**Veg Condition** Excellent.**Fire Age** Old.**Notes** Aspect: N/A.

Bare Ground: 90%.

Litter Cover: 1% Logs, 3% Twigs, 1% Lvs.

Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	7%		5 m	OP141.02
	<i>Acacia ayersiana</i>	1%		2.5 m	OP141.08
	<i>Acacia pruinocarpa</i>	+		4 m	OP02.08
	<i>Acacia rhodophloia</i>	1%		2.5 m	NC
	<i>Acacia tetragonophylla</i>	2%		2.5 m	NC
	<i>Bidens bipinnata</i>	+		0.1 m	OP59.08
	<i>Codonocarpus cotinifolius</i>	+		5 m	NC
					Within the same vegetation association (out of plot).
	<i>Eragrostis eriopoda</i>	+		0.2 m	OP97.12
	<i>Eremophila exilifolia</i>	12%		0.8 m	OP141.06
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	8%		0.8 m	OP141.04
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	2%		0.8 m	OP141.05
	<i>Eremophila latrobei</i> x <i>forrestii</i>	+		1.5 m	OP141.07
	<i>Eucalyptus gamophylla</i>	+		3.5 m	NC
					Within the same vegetation association (out of plot).

<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	1%	6 m	OP141.01
<i>Grevillea berryana</i>	2%	5 m	OP141.03
<i>Psyrax latifolia</i>	+	1.8 m	OP89.03
<i>Rulingia luteiflora</i>	+	1.2 m	OP02.16
<i>Tribulus suberosus</i>	+	0.6 m	OP25.05
<i>Triodia pungens</i>	5%	0.3 m	OP141.09
<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	1%	0.2 m	OP141.10

**Ophthalmia** Site OP143**Described by** BW **Date** 21/05/2010 **Type** Q

50 x 50 m

**Location** Ophthalmia.**MGA Zone** 50 742437 mE 7421633 mN**Habitat** Low undulating hill.**Soil** Red-brown loam with cobbles and pebbles covering the soil surface.**Rock Type** Ironstone.

**Vegetation** Broad Floristic Formation: *Triodia* Hummock Grassland  
 Vegetation Association: Hummock Grassland of *Triodia wiseana*, *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and *T. pungens* with Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* on Red-brown loam with a covering of cobbles and pebbles on low hills  
 Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Very Open Mallees of *Eucalyptus gamophylla* with Open Shrubland of *Acacia ancistrocarpa* and *Acacia inaequilatera*.

**Veg Condition** Excellent.**Fire Age** Moderate.

**Notes** Aspect: N/A.  
 Bare Ground: 75%.  
 Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
 Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia ancistrocarpa</i>	1%		1 m	OP93.02
	<i>Acacia aneura</i> var. <i>conifera</i>	+		0.4 m	OP143.03
	<i>Acacia citrinoviridis</i>	+		1 m	OP143.06
	<i>Acacia inaequilatera</i>	1%		0.5-1.5 m	OP93.01
	<i>Acacia maitlandii</i>	+		1.2 m	NC
	<i>Acacia synchronicia</i>	+		1.5 m	OP143.04
	<i>Acacia tenuissima</i>	+		1 m	OP143.05
	<i>Acacia tetragonophylla</i>	+		0.8 m	NC
	<i>Eucalyptus gamophylla</i>	2%		2 m	OP02.21
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	+		2 m	OP57.06
	<i>Hakea chordophylla</i>	+		0.5 m	NC
	<i>Melaleuca eleuterostachya</i>	+		0.7 m	OP143.02
	<i>Triodia wiseana</i>	25%		0.3 m	OP143.01





**Ophthalmia**                      **Site**    OPRCS01  
**Described by** CS                                      **Date** 19/05/2010 **Type** R

**Location**    Ophthalmia.

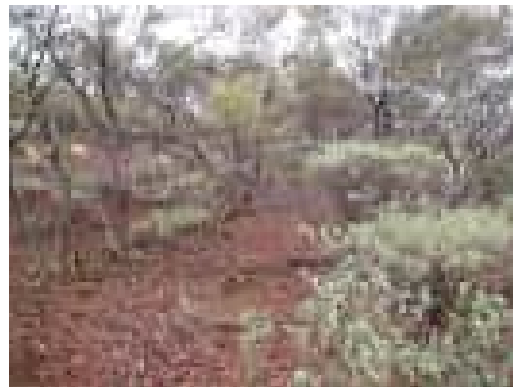
**MGA Zone**    **50**            746198 **mE**            7422662 **mN**

**Habitat**        Rocky hillside.

**Soil**             Red-brown clayey loam with cobbles and pebbles scattered on the soil surface.

**Rock Type**    Ironstone.

**Vegetation**    Broad Floristic Formation:  
 Vegetation Association:  
 Vegetation Sub-Association: High Open Shrubland of *Acacia aneura* var. *aneura* with Open Shrubland of *Eremophila forrestii* subsp. *forrestii*, *Eremophila fraseri* subsp. *fraseri* and *Eremophila oppositifolia* subsp. *angustifolia* with Very Open Hummock Grassland of *Triodia wiseana* with Scattered Herbs of *Malvastrum americanum*.



**Veg Condition**    Excellent.

**Fire Age**        Old.

**Notes**            Aspect: South.  
 Bare Ground: 95%.  
 Litter Cover: 2% Logs, 2% Twigs, 5% Lvs.  
 Disturbance: Grazing.

#### SPECIES LIST:

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia aneura</i> var. <i>aneura</i>	15%		3 m	OP11.11 Flowering.
	<i>Acacia distans</i>	+		3 m	OP36.02
	<i>Capparis lasiantha</i>	+		1 m	OP03.09 Flowering.
	<i>Duperreya commixta</i>	+		CL	OP03.05
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	3%		1 m	OP36.01
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	1%		1 m	OP41.01
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	1%		1.5 m	OP13.03 Flowering.
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	+		1.5 m	OP11.13
	<i>Malvastrum americanum</i>	1%		0.4 m	OPRCS01.01
	<i>Scaevola spinescens</i>	+		1 m	OP13.06
	<i>Triodia wiseana</i>	2%		0.5 m	OP102.02

**Ophthalmia**                      **Site**    OPRE02  
**Described by** EC                                      **Date** 18/05/2010 **Type** R

**Location**    Ophthalmia.

**MGA Zone**    50                      743839 **mE**                      7421296 **mN**

**Habitat**        Quartz plain.

**Soil**             Light borwn-salmon loam with cobbles and pebbles covering the soil surface.

**Rock Type**    Quartz.

**Vegetation**    Broad Floristic Formation:  
                           Vegetation Association:  
                           Vegetation Sub-Association: Open Hummock Grassland of *Triodia wiseana* with Very Open Mallees of *Eucalyptus socialis* subsp. *eucentrica* with Low Open Shrubland of *Tecticornia auriculata*.



**Veg Condition**    Pristine.

**Fire Age**        Old.

**Notes**            Aspect: N/A.  
                           Bare Ground: 60%.  
                           Litter Cover: <1% Logs, <1% Twigs, <1% Lvs.  
                           Disturbance: N/A.

**SPECIES LIST:**

Quad	Name	Cover	C Class	Height	Specimen Notes
	<i>Acacia tenuissima</i>	+		0.5 m	OPER02.02
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	3%		2 m	OP03.03
	<i>Tecticornia auriculata</i>	2%		0.5 m	OPER02.01
	<i>Triodia wiseana</i>	20%		0.3 m	OP82.01

# **APPENDIX F**

## **MATRIX OF SPECIES FOUND WITHIN EACH SITE**









# **APPENDIX G**

## **BUSH FOREVER CONDITION SCALE**



## APPENDIX G

## BUSH FOREVER VEGETATION CONDITION SCALE

Condition Scale Code	Condition Scale
<b>P</b>	<b>Pristine (1)</b> Pristine or nearly so, no obvious signs of disturbance
<b>E</b>	<b>Excellent (2)</b> Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
<b>VG</b>	<b>Very Good (3)</b> Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
<b>G</b>	<b>Good (4)</b> 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 very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
<b>D</b>	<b>Degraded (5)</b> 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.
<b>CD</b>	<b>Completely Degraded (6)</b> 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 or shrubs.

Source: Government of Western Australia (2000). *Bush Forever Volume 2: Directory of Bush Forever Sites*. Department of Environmental Protection, Perth, Western Australia.

# APPENDIX H

# DENDROGRAM

## APPENDIX H

### DENDROGRAM

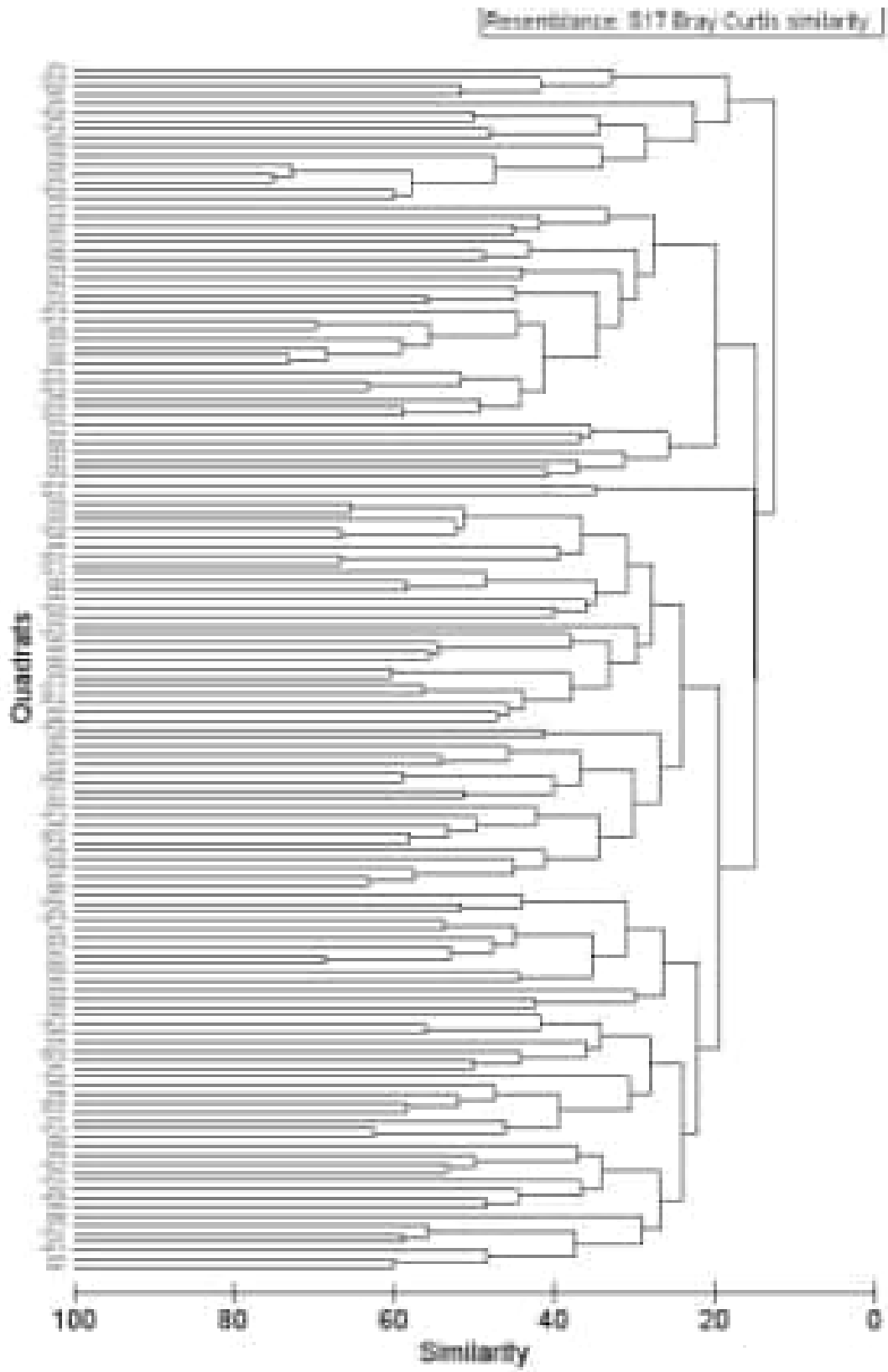
Vegetation data from the Ophthalmia survey was analysed to determine vegetation associations. Data was prepared by removing clearly erroneous records, species only identified to genera and singletons. Annual species were kept in the dataset because the survey was completed at one instance, and therefore annual species variation was not considered to be a constraint to data analysis.

Quadrat data was then transformed (presence/absence) to improve normality. Presence/absence, a harsh treatment of data, was selected for analysis for a number of reasons. Firstly, to account for different botanists being involved in the surveys, whose cover value estimates are likely not to have been normally distributed (i.e. skewed to high and low end of distribution curve). Whilst, normality is less important in multivariate statistics, the underlying assumptions of normal distribution are still a requisite. Secondly, presence/absence is the favoured analysis for DEC analysis. Note, a number of other transformations were also investigated (square root and logarithmic), but presence/absence was selected as being the most appropriate prior to analysis, and proved to be in post-hoc analysis of other transformations.

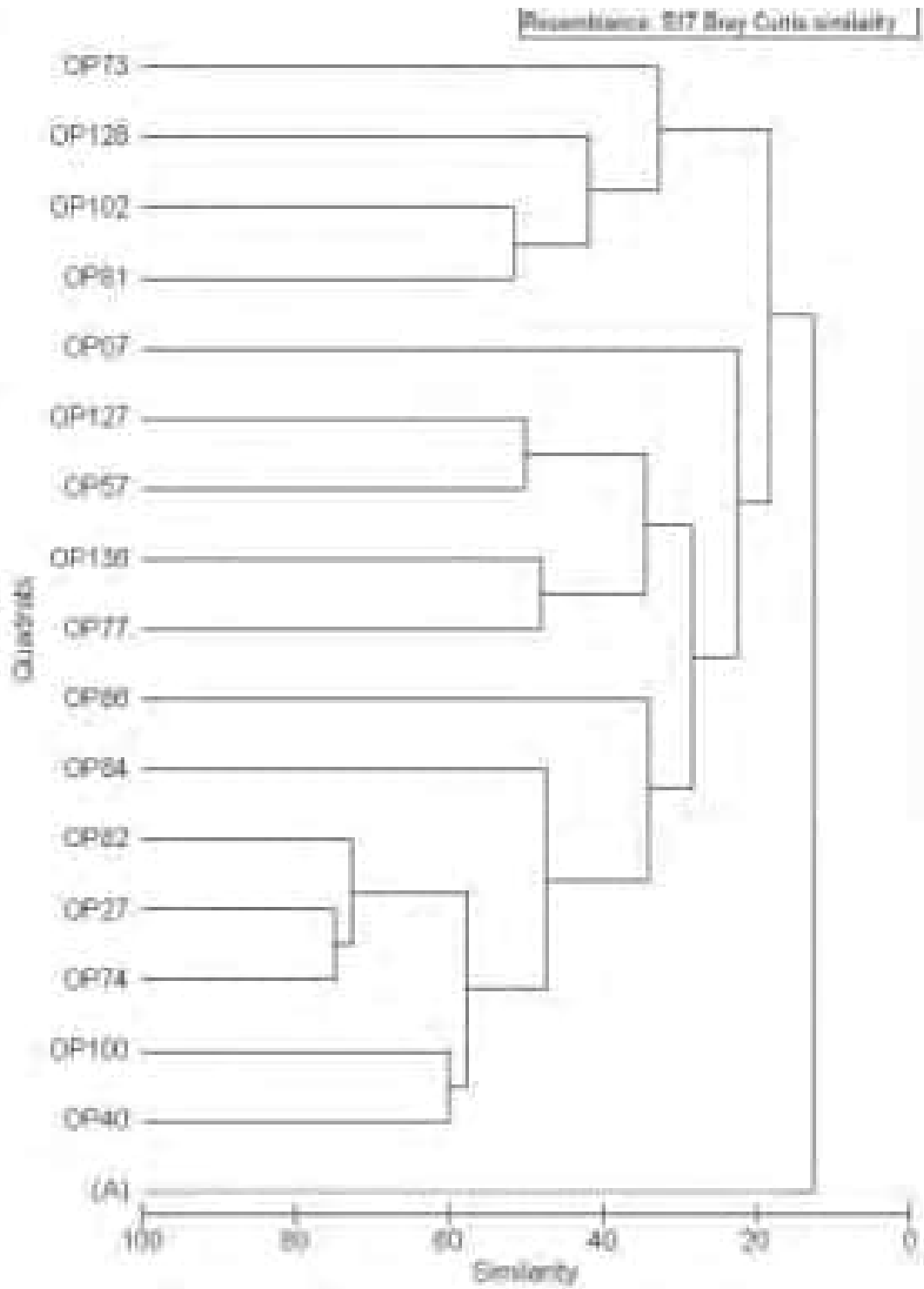
Once data was treated a similarity matrix based on Bray-Curtis similarities was computed using *Primer-E* version 6.1.5 (2006). Using this similarity matrix a dendrogram was then computed, using hierarchical agglomerative cluster analysis. The dendrogram was checked and found to be satisfactory, based on visual analysis of results. Non-Metric Multi Dimensional Scaling (NMDS) was also computed alongside the cluster analysis, but was less effective at delineating quadrats, with a Stress value of 0.27. This level of stress is towards the higher end of acceptability, although because a large number of quadrats (>50) was analysed can be considered useful (Clarke and Warwick 2001). Therefore delineation of vegetation associations was based primarily on the results of the dendrogram, with cross checks with visual analysis.

The cluster analysis resulted in the clear and distinct separation of the quadrat into each of the distinct vegetation associations. These groups were typically associated with landform, which is generally known to drive composition and structure in the Pilbara region. The following pages detail the results of the statistical analysis, firstly providing an overview of the whole dendrogram and then the dendrogram broken down by vegetation association.

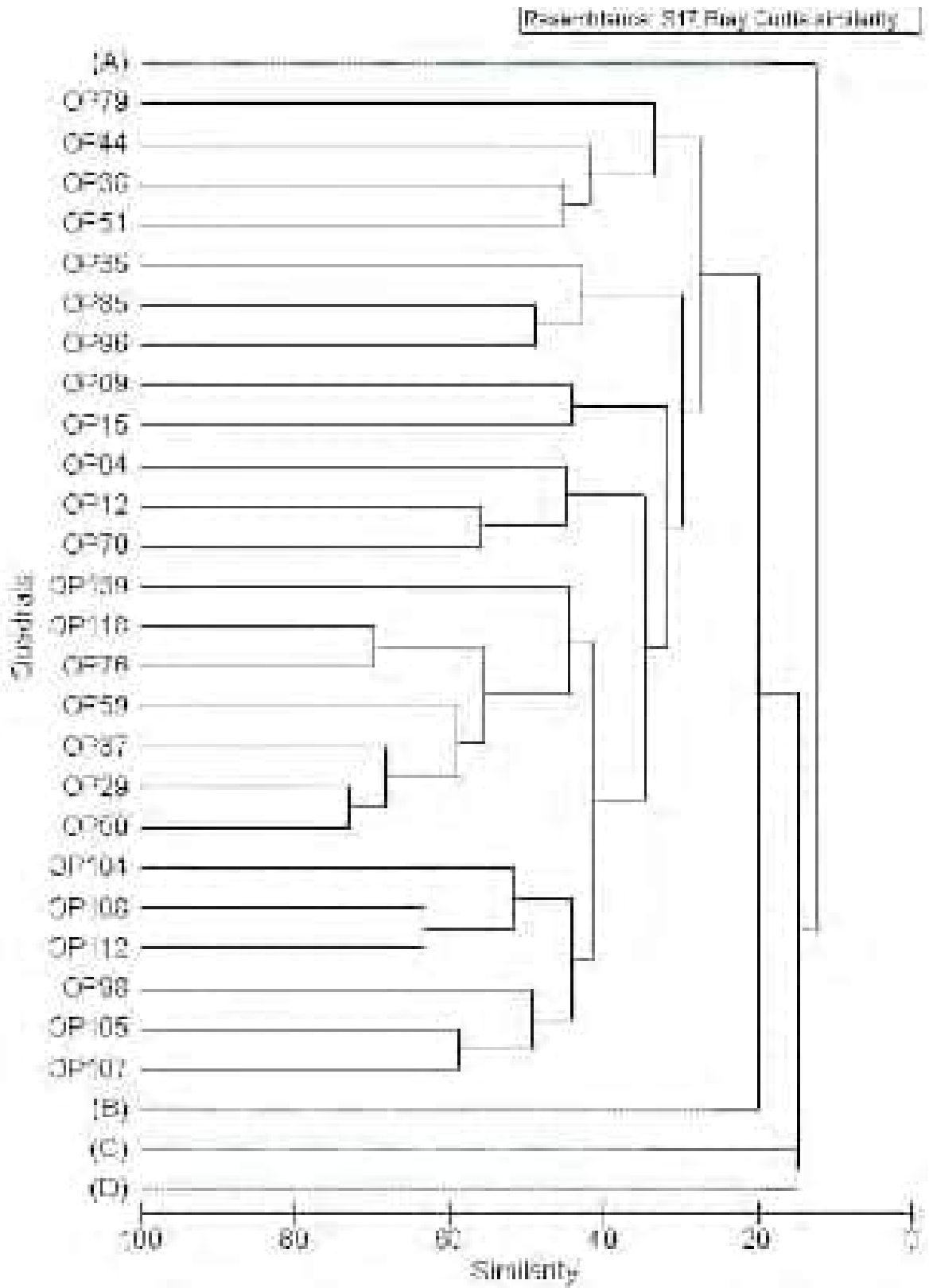
Overview (breakdown follows)



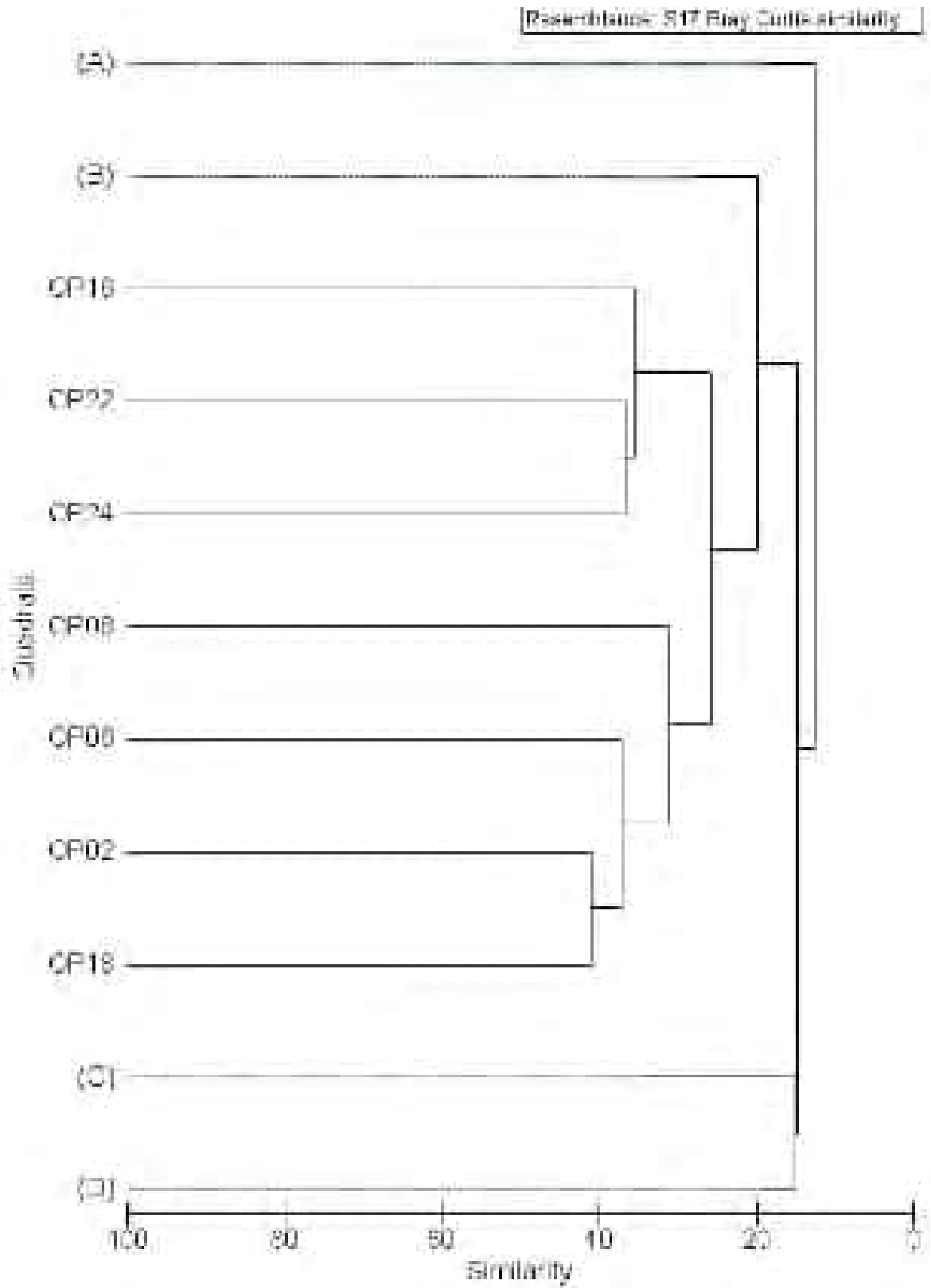
Red



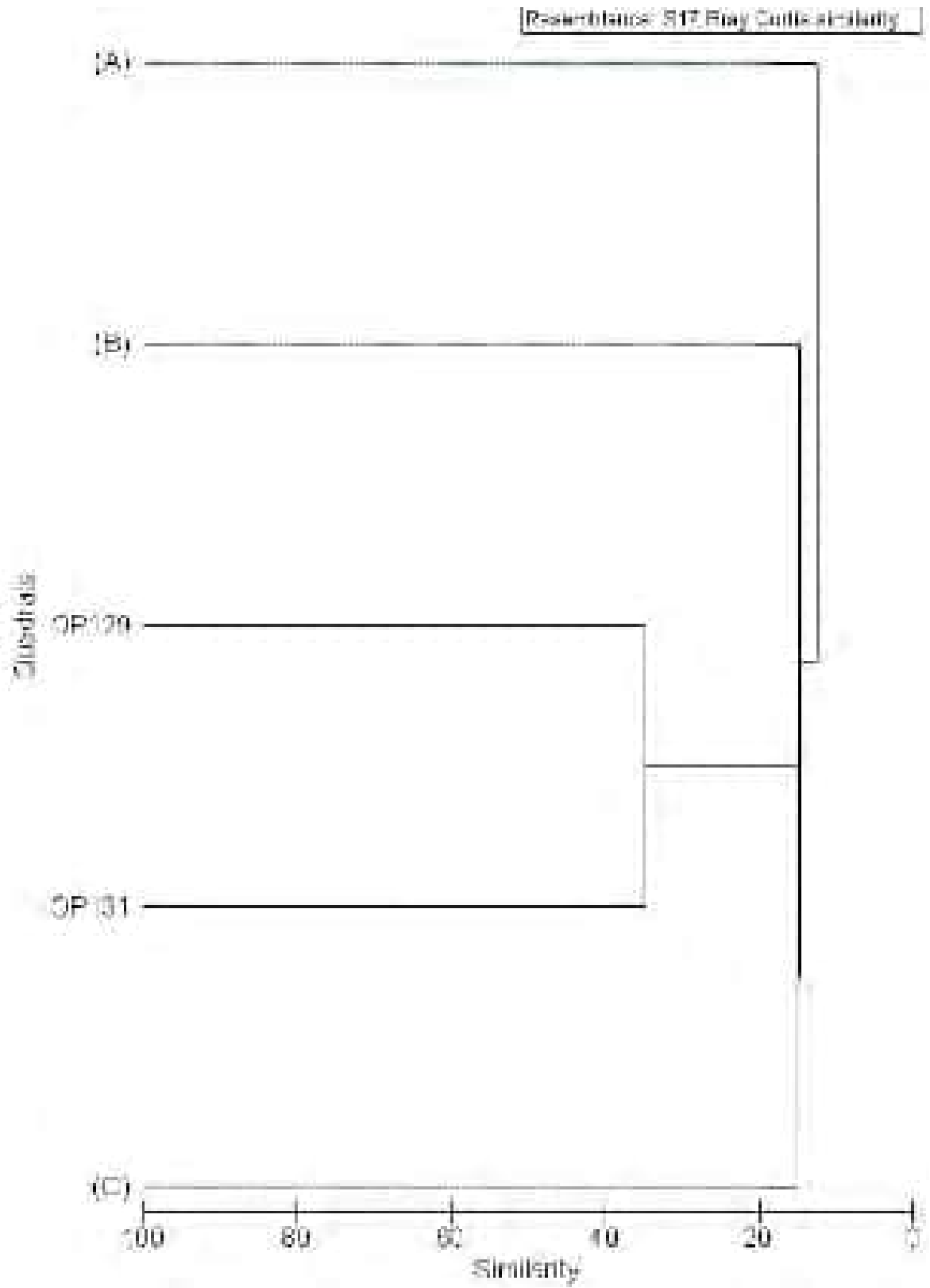
Blue



Orange

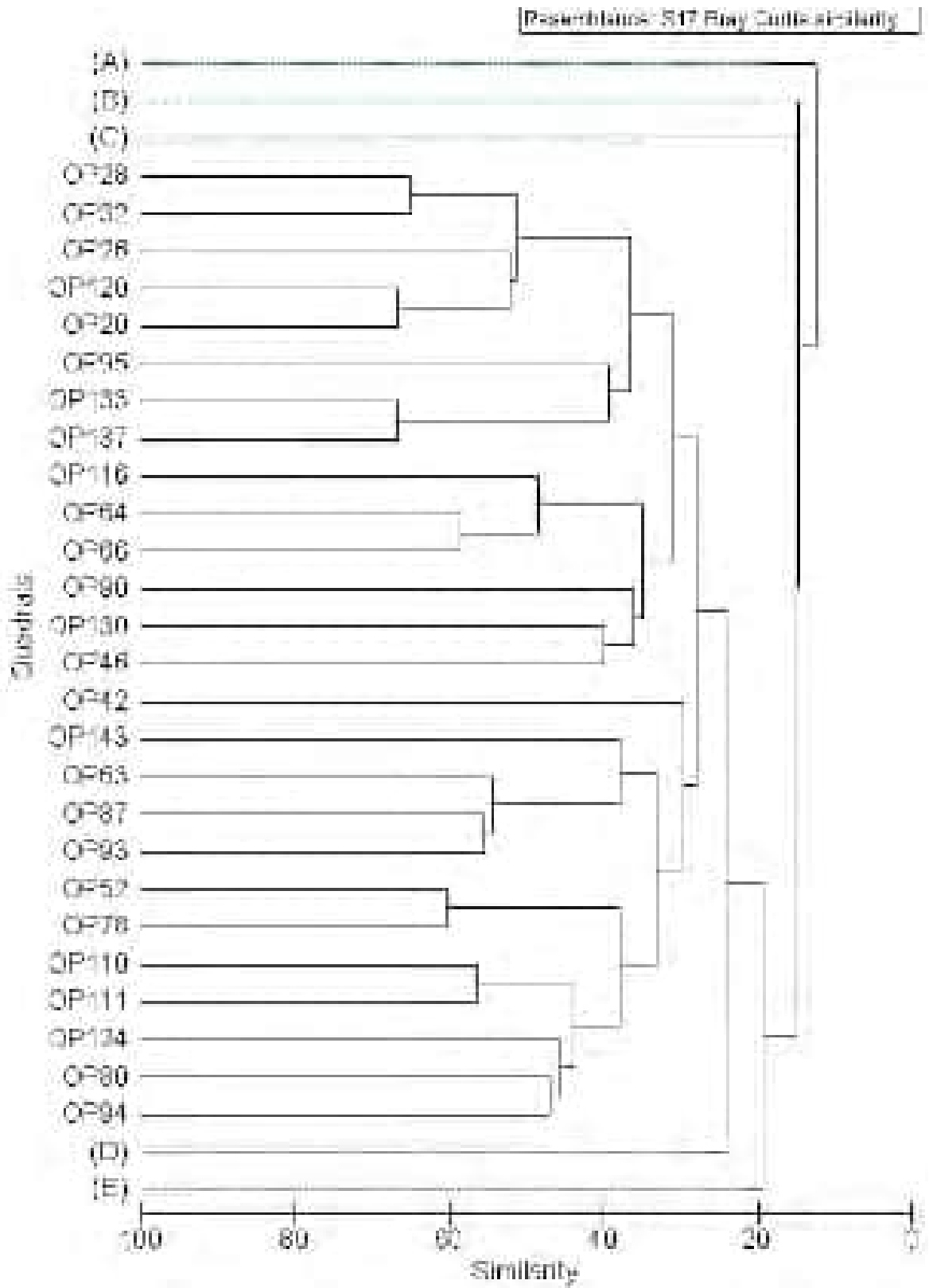


### Dark Green

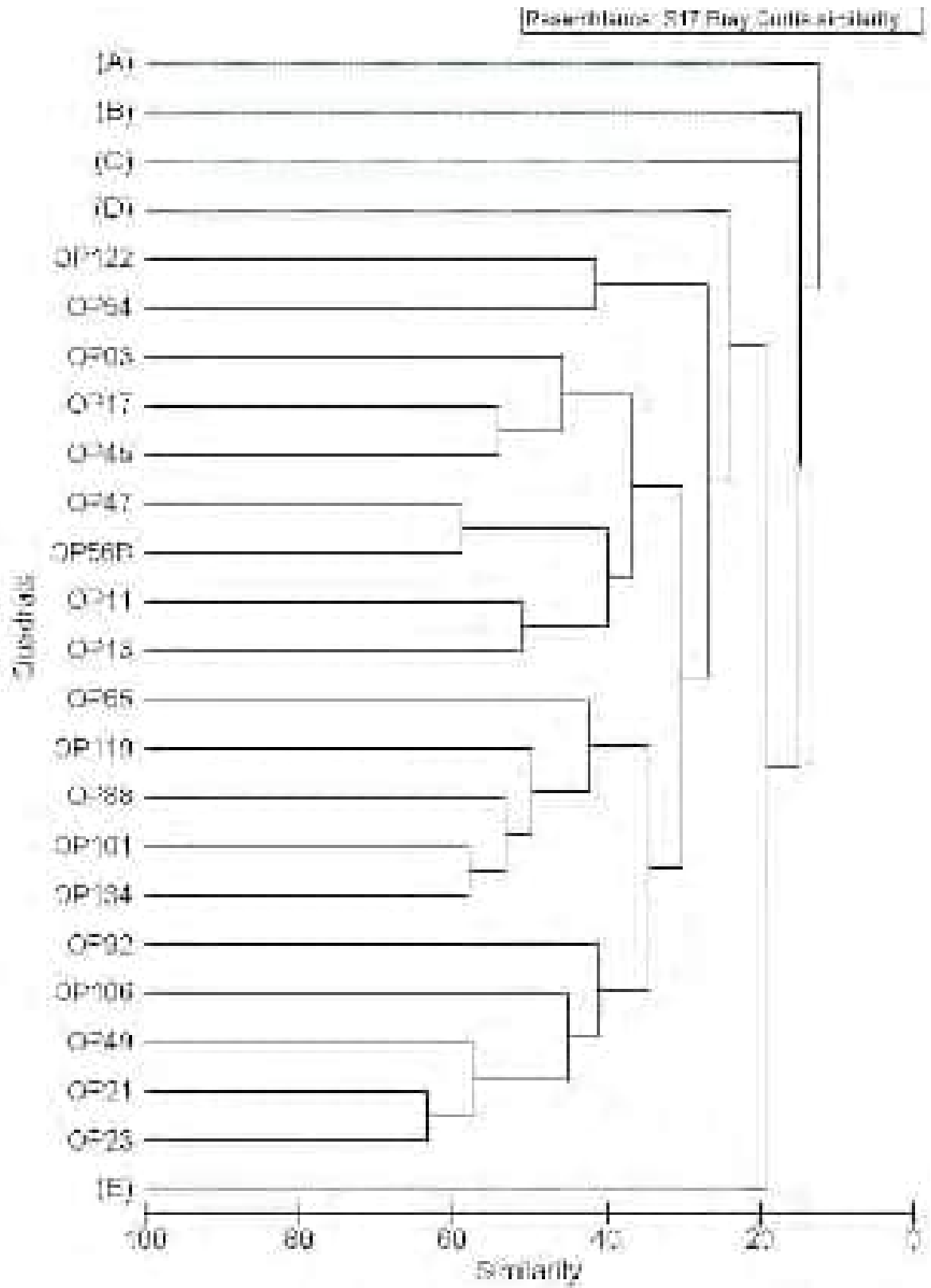




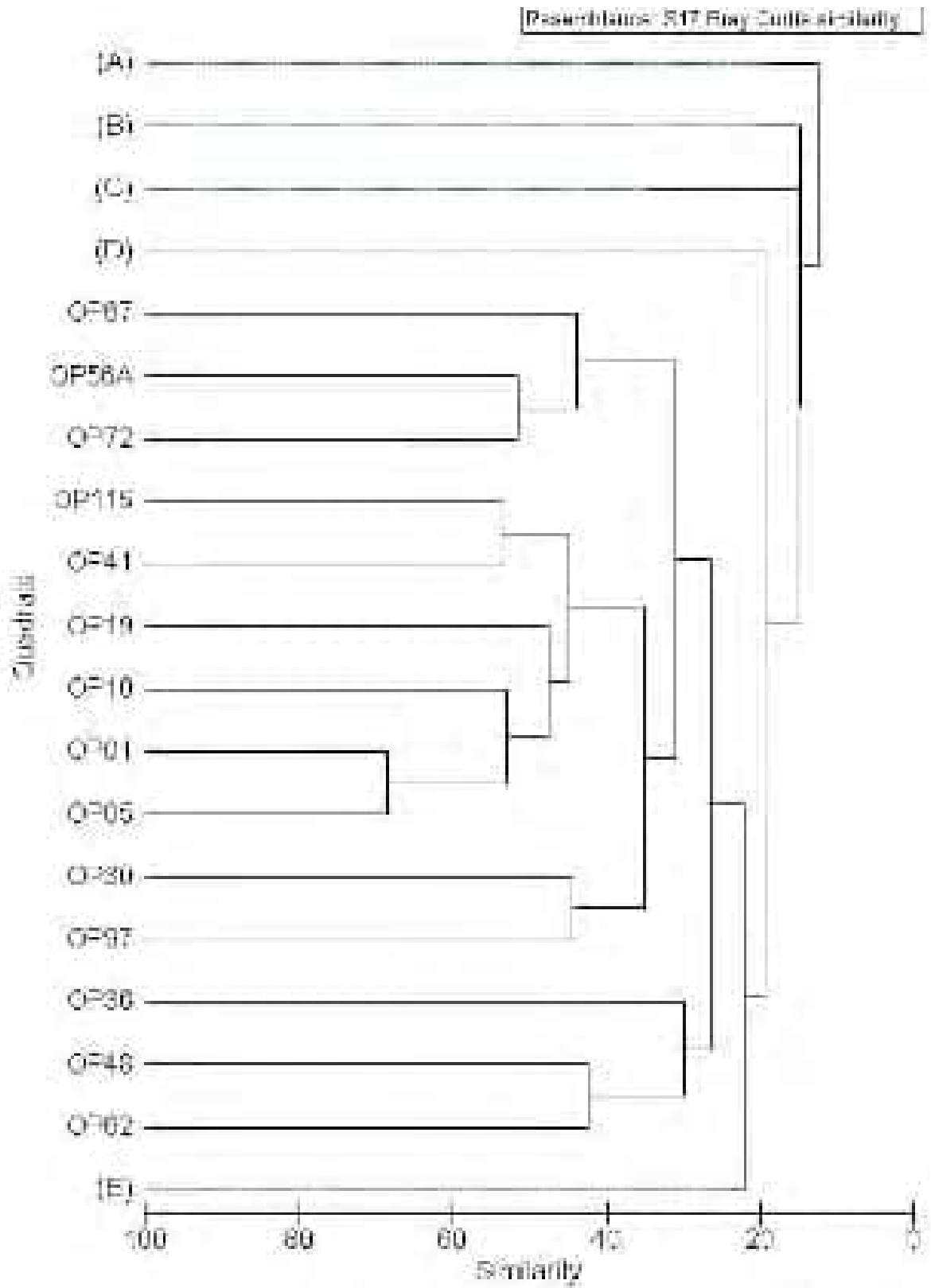
**Brown**



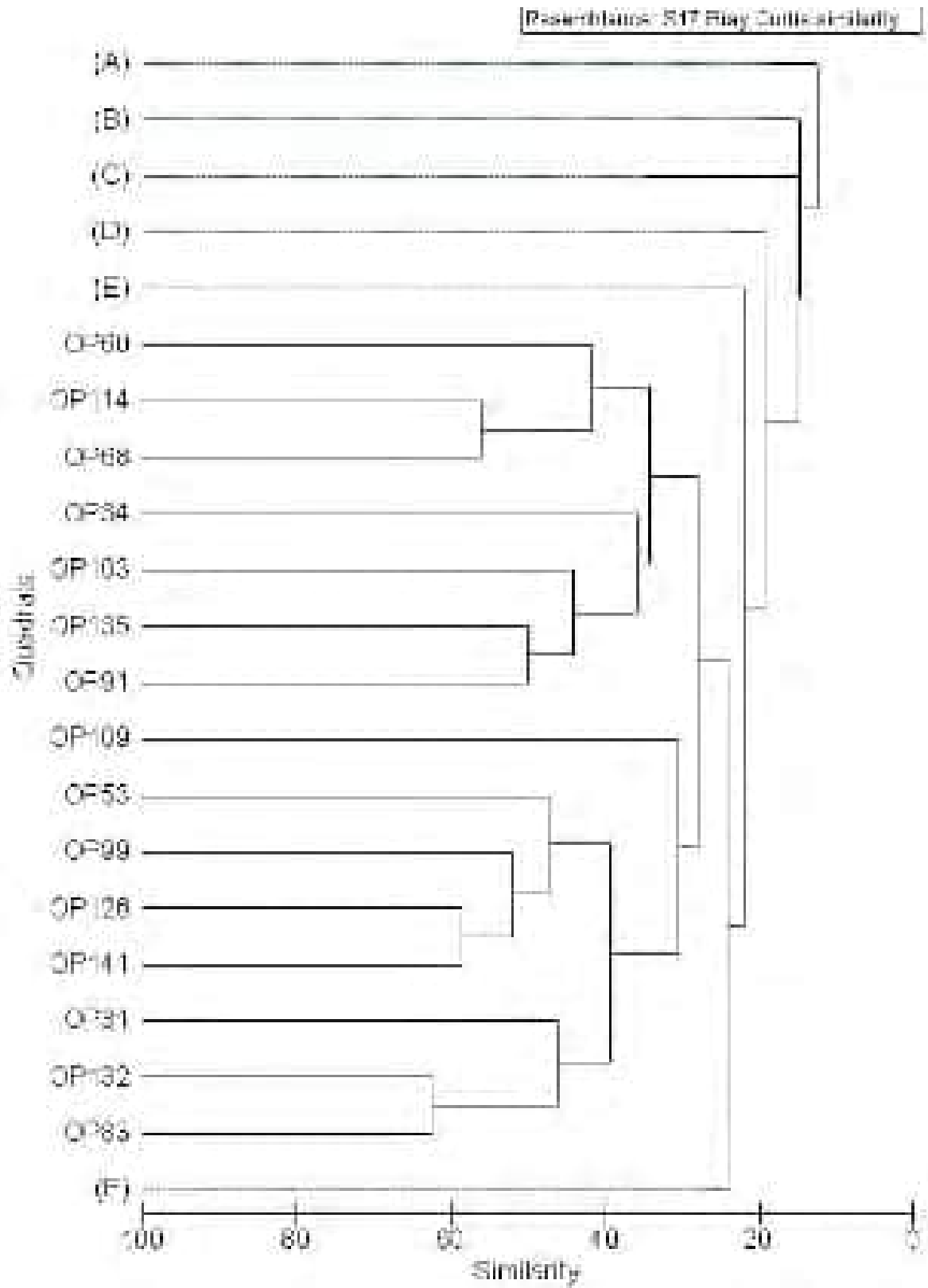
Pink



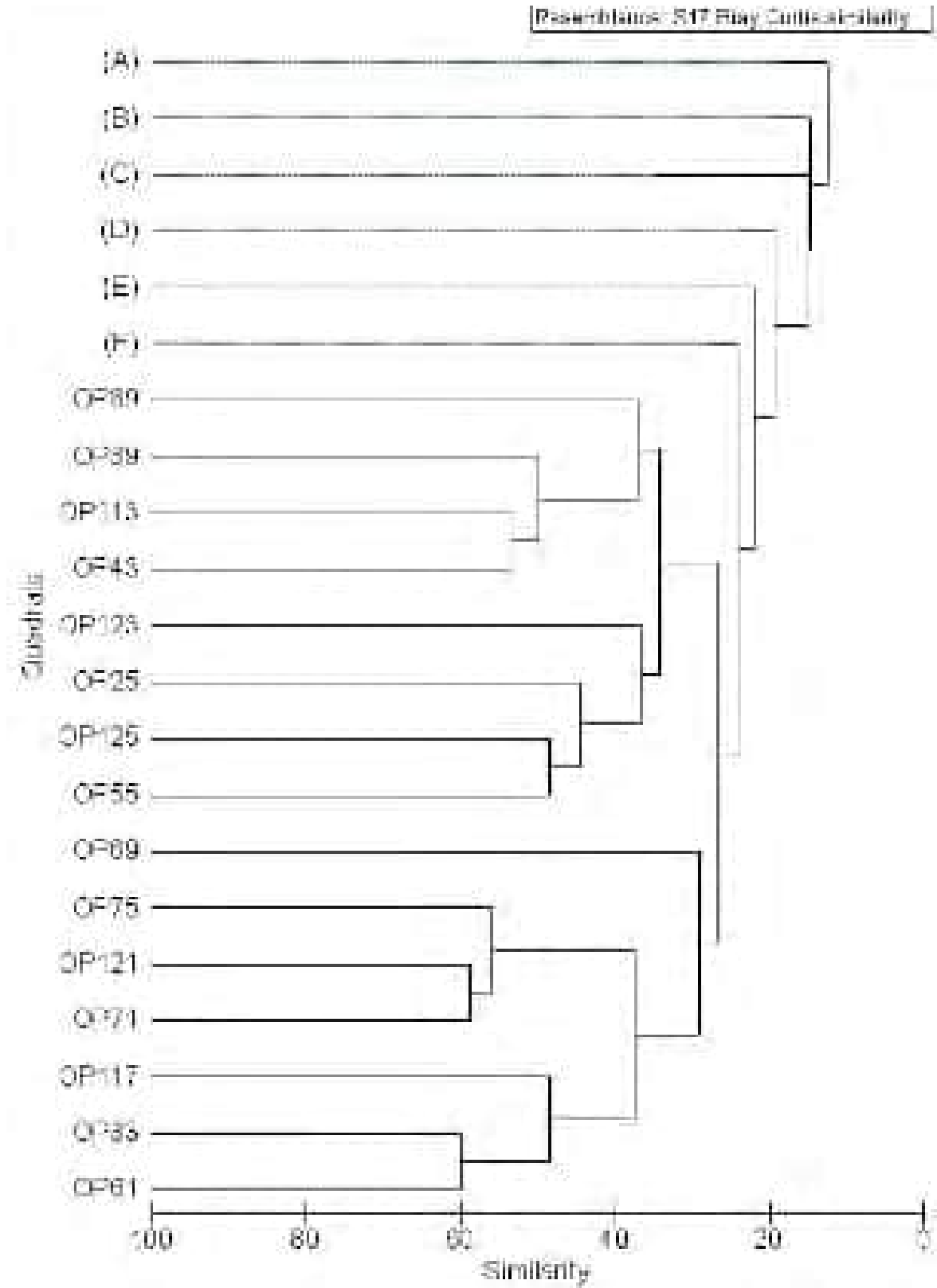
Green



**Aluminous**



Grey



Quadrats denoted by yellow rectangles represent vegetation association 2a.

## References

Western Australian Herbarium (2010) *Florabase - Information on the Western Australian Flora*. Department of Environment and Conservation, Perth. Online: <http://florabase.calm.wa.gov.au/>. [April 2010].

Clarke and Warwick 2001. *Change in Marine Communities. An Approach to Statistical Analysis and Interpretation*. 2<sup>nd</sup> Edition. Primer-E Ltd.

# APPENDIX I

## HABITAT ASSESSMENT DATA SHEETS

## APPENDIX H

### HABITAT ASSESSMENT DATA SHEETS

#### Habitat Assessment - HA 1

##### Generic

**Broad Fauna Habitat:** Hill Slope

**UTM Co-ordinates Easting:** 734493

**Northing:** 7420622

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

#### Habitat Structure and Microhabitats

<b>Aspect:</b>	N/A	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevice: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris <1%, Bare Ground 80%			

#### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Eucalyptus gamophylla</i>	<2%	1-2m
<b>Understorey:</b>	<i>Triodia</i> sp. Shovelana Hill	2-10%	<0.5m
<b>Condition Rating:</b>	Very Good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	New		

**Other Relevant Information:** Suitable habitat for Western Pebble-mound Mouse.



## Habitat Assessment - HA 2

### Generic

**Broad Fauna Habitat:** Break Away

**UTM Co-ordinates Easting:** 737291

**Northing:** 7422464

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	South	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	Moderate	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	Common	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris <1%, Bare Ground 50%			

### Vegetation

	Vegetation Species	Cover	Height
<b>Stratum</b>			
<b>Overstorey:</b>	<i>Eucalyptus leucophloia</i>	<2%	4m
<b>Midstorey :</b>	<i>Acacia prunicarpa</i>	10-30%	2-3m
<b>Understorey:</b>	<i>Triodia pungens</i> and <i>Eriachne tenuiculmis</i>	30-70%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

### Habitat Assessment - HA 3

#### Generic

#### Generic

**Broad Fauna Habitat:** Hill Crest

**UTM Co-ordinates Easting:** 737229

**Northing:** 7422710

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

#### Habitat Structure and Microhabitats

<b>Aspect:</b>	N/A	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	Moderate	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	Rare	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	Moderate	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris <1%, Bare Ground 40%			

#### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Acacia prunicarpa</i>	2-10%	2m
<b>Understorey:</b>	<i>Triodia</i> sp. Shovelana Hill	30-70%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Moderate level of suitable habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 4

### Generic

### Generic

**Broad Fauna Habitat:** Break Away

**UTM Co-ordinates Easting:** 737184

**Northing:** 7422724

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	North	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	Common	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	Rare	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	Common	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 5%, Bare Ground 45%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Acacia aneura</i> var. <i>intermedia</i>	<2%	6m
<b>Midstorey :</b>	<i>Acacia adoxa</i> var. <i>adoxo</i>	2-10%	2m
<b>Understorey:</b>	<i>Triodia pungens</i> and <i>Eriachne tenuiculmis</i>	30-70%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 5

### Generic

### Generic

**Broad Fauna Habitat:** Minor Drainage

**UTM Co-ordinates Easting:** 734741

**Northing:** 7423876

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	Rare	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	Common	<b>Tree Hollows:</b>	Small: Rare	Large: None
<b>Cracks:</b>	Rare	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	Moderate	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 20%, Bare Ground 30%			

### Vegetation

	<b>Vegetation Species</b>	<b>Cover</b>	<b>Height</b>
<b>Stratum</b>			
<b>Overstorey:</b>	<i>Corymbia hamersleyana/ Acacia aneura var. microcarpa</i>	2-10%	6m
<b>Midstorey :</b>	<i>Petalostylis labicheoides</i>	2-10%	3m
<b>Understorey:</b>	<i>Triodia melvillei</i>	0.5m	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 6

### Generic

### Generic

**Broad Fauna Habitat:** Minor Drainage

**UTM Co-ordinates Easting:** 728987

**Northing:** 7424713

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam/Riversand	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 5%, Bare Ground 55%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Acacia aneura</i> var. <i>intermedia</i>	2-10%	4m
<b>Midstorey :</b>	<i>Acacia catenulata</i> var. <i>occidentalis</i>	<2%	2m
<b>Understorey:</b>	<i>Themeda triandra</i>	10-30%	<0.5m
<b>Condition Rating:</b>	Very good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 7

### Generic

### Generic

**Broad Fauna Habitat:** Stony Plain

**UTM Co-ordinates Easting:** 728586

**Northing:** 7424449

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 70%			

### Vegetation

	Vegetation Species	Cover	Height
<b>Stratum</b>			
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Acacia prunicarpa</i>	10-30%	2m
<b>Understorey:</b>	<i>Triodia wiseana</i>	30-70%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Moderate level of suitable habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 8

### Generic

### Generic

**Broad Fauna Habitat:** Break Away

**UTM Co-ordinates Easting:** 728490

**Northing:** 7423782

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	Moderate	
<b>Soils:</b>	Exposed Rock	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	Common	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	Common	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 5%, Bare Ground 65%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus leucophloia</i>	<2%	4m
<b>Midstorey :</b>	<i>Acacia aneura</i> var. <i>aneura</i> /Immature <i>Eucalyptus leucophloia</i>	2-10%	2m
<b>Understorey:</b>	<i>Triodia melvillei</i> and <i>Scaveola parviflora</i> subsp. <i>pilbarae</i>	10-30%	0.3m
<b>Condition Rating:</b>	Good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	New		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 9

### Generic

### Generic

**Broad Fauna Habitat:** Alluvial Plain

**UTM Co-ordinates Easting:** 727564

**Northing:** 7423146

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris <1%%, Bare Ground 70%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Acacia aneura</i> var. <i>microcarpa</i>	10-30%	4m
<b>Midstorey :</b>	<i>Acacia kempeana</i> ./ <i>Codonocarpus cotiniifolius</i>	10-30%	2m
<b>Understorey:</b>	<i>Triodia melvillei</i>	<2%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.



## Habitat Assessment - HA 10

### Generic

### Generic

**Broad Fauna Habitat:** Stony Plain

**UTM Co-ordinates Easting:** 733192

**Northing:** 7424036

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 70%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Eucalyptus gamophylla</i>	10-30%	2m
<b>Understorey:</b>	<i>Triodia pungens</i>	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Moderate level of suitable habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 11

### Generic

### Generic

**Broad Fauna Habitat:** Major Drainage

**UTM Co-ordinates Easting:** 731901

**Northing:** 7424443

**Habitat Value:** High



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam/Riversand	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	Rare	<b>Tree Hollows:</b>	Small: Moderate	Large: Rare
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 20%, Bare Ground 29%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus victrix</i>	2-10%	8m
<b>Midstorey :</b>	<i>Acacia citrinovirdis</i>	2-10%	4m
<b>Understorey:</b>	Mixed grasses and herbs	30-70%	0.5-1m
<b>Condition Rating:</b>	Very Good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 12

### Generic

### Generic

**Broad Fauna Habitat:** Major Drainage

**UTM Co-ordinates Easting:** 740852

**Northing:** 7423718

**Habitat Value:** High



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression		<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Riversand	Loam/	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	nil		<b>Tree Hollows:</b>	Small: Moderate	Large: None
<b>Cracks:</b>	nil		<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil		<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 5%, Bare Ground 65%				

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus victrix</i>	<2%	6m
<b>Midstorey :</b>	<i>Acacia aneura</i> var. <i>aneura</i>	10-30%	3m
<b>Understorey:</b>	Mixed grasses	10-30%	0.5m
<b>Condition Rating:</b>	Very Good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 13

### Generic

### Generic

**Broad Fauna Habitat:** Hill Crest

**UTM Co-ordinates Easting:** 741584

**Northing:** 7422870

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	South	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Exposed Rock	<b>Surface rocks:</b>	Small: Moderate	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	Moderate	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	Moderate	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 30%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Acacia aneura</i>	2-10%	3m
<b>Midstorey :</b>	<i>Acacia ancistrocarpa</i>	<2%	1.5m
<b>Understorey:</b>	<i>Triodia</i> sp.Shovelana Hill	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 14

### Generic

### Generic

**Broad Fauna Habitat:** Minor Drainage

**UTM Co-ordinates Easting:** 745584

**Northing:** 7424126

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Riversand	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris <1%, Bare Ground 60%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Corymbia hamersleyana</i>	<2%	4m
<b>Midstorey :</b>	<i>Petalostylis labicheoides/ Acacia citrinoviridis</i>	30-70%	2m
<b>Understorey:</b>	<i>Triodia wiseana</i>	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 15

### Generic

### Generic

**Broad Fauna Habitat:** Major Drainage

**UTM Co-ordinates Easting:** 745346

**Northing:** 7422721

**Habitat Value:** High



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Riversand	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: Moderate	Large: Rare
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 10%, Bare Ground 60%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus victrix</i>	<2%	6-15m
<b>Midstorey :</b>	<i>Petalostylis labicheoides/ Acacia aneura var. pilbarana</i>	2-10%	2m
<b>Understorey:</b>	<i>Triodia pungens</i>	10-30%	0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 16

### Generic

### Generic

**Broad Fauna Habitat:** Alluvial Plain

**UTM Co-ordinates Easting:** 739968

**Northing:** 7424241

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Rare	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 50%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus xerothermica</i>	<2%	4m
<b>Midstorey :</b>	<i>Hakea lorea</i> subsp. <i>lorea.</i> / <i>Acacia pruinocarpa</i>	10-30%	1-2m
<b>Understorey:</b>	<i>Triodia pungens</i> / <i>Themeda triandra</i>	10-30%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 17

### Generic

### Generic

**Broad Fauna Habitat:** Hill Slope

**UTM Co-ordinates Easting:** 736675

**Northing:** 7424014

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	South West	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Exposed Rock	<b>Surface rocks:</b>	Small: Common	Large: Common
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: Moderate	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 40%			

### Vegetation

	<b>Vegetation Species</b>	<b>Cover</b>	<b>Height</b>
<b>Stratum</b>			
<b>Overstorey:</b>	<i>Eucalyptus leucophloia</i>	<2%	5m
<b>Midstorey :</b>	<i>Eucalyptus gamophylla/ Hakea lorea</i> subsp. <i>lorea</i>	<2%	2m
<b>Understorey:</b>	<i>Triodia wiseana</i>	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** This is ideal Habitat for the Western Pebble-mound Mouse.



## Habitat Assessment - HA 18

### Generic

### Generic

**Broad Fauna Habitat:** Major Drainage

**UTM Co-ordinates Easting:** 738239

**Northing:** 7421916

**Habitat Value:** High



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Depression	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Riversand	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 10%, Bare Ground 60%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptu xerothermica</i>	<2%	4m
<b>Midstorey :</b>	<i>Petalostylis labicheoides/ Acacia citrinoviridis</i>	10-30%	2m
<b>Understorey:</b>	<i>Eulalia aurea/ Chrysopogon fallax/ Themeda trianda/ Trioida pungens</i>	10-30%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

## Habitat Assessment - HA 19

### Generic

### Generic

**Broad Fauna Habitat:** Hill Crest

**UTM Co-ordinates Easting:** 734948

**Northing:** 7421659

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	Moderate	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 5%, Bare Ground 65%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Hakea lorea</i> subsp. <i>lorea</i>	<2%	2.5m
<b>Understorey:</b>	<i>Triodia brizoides</i>	30-70%	<0.5m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Moderate level of suitable habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 20

### Generic

### Generic

**Broad Fauna Habitat:** Hill Slope

**UTM Co-ordinates Easting:** 735123

**Northing:** 7423439

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	East	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Moderate
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: Rare	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 40%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	2-10%	5m
<b>Midstorey :</b>	<i>Acacia bivenosa</i>	2-10%	2m
<b>Understorey:</b>	<i>Triodiapungens</i> / <i>T. wiseana</i>	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** This is suitable Habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 21

### Generic

### Generic

**Broad Fauna Habitat:** Stony Plain

**UTM Co-ordinates Easting:** 729023

**Northing:** 7425520

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Common	Large: Rare
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 10%, Bare Ground 40%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	Nil		
<b>Midstorey :</b>	<i>Eucalyptus gamophylla/ Acacia kempeana</i>	10-30%	2m
<b>Understorey:</b>	<i>Triodia melvillei/ T. sp. Shovelana Hill</i>	30-70%	0.3m
<b>Condition Rating:</b>	Excellent		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** This is suitable Habitat for the Western Pebble-mound Mouse.

## Habitat Assessment - HA 22

### Generic

### Generic

**Broad Fauna Habitat:** Alluvial Plain

**UTM Co-ordinates Easting:** 732306

**Northing:** 7425068

**Habitat Value:** Moderate



**Total Area of Habitat:**

**Proportion of Project Area:**

### Habitat Structure and Microhabitats

<b>Aspect:</b>	Flat	<b>Exfoliating Slabs:</b>	nil	
<b>Soils:</b>	Red-brown Loam	<b>Surface rocks:</b>	Small: Rare	Large: None
<b>Boulders:</b>	nil	<b>Tree Hollows:</b>	Small: None	Large: None
<b>Cracks:</b>	nil	<b>Caves:</b>	nil	Crevices: No
<b>Cliffs :</b>	nil	<b>Suitability for bats:</b>	nil	
<b>Litter Cover:</b>	Woody Debris 0%, Bare Ground 40%			

### Vegetation

Stratum	Vegetation Species	Cover	Height
<b>Overstorey:</b>	<i>Acacia aneura</i> var. <i>intermedia</i>	2-10%	4m
<b>Midstorey :</b>	<i>Acacia citrinoviridis</i> / <i>A. elachantha</i> / <i>Corymbia deserticola</i> subsp. <i>deserticola</i>	30-70%	2m
<b>Understorey:</b>	<i>Triodia melvillei</i>	30-70%	<0.5m
<b>Condition Rating:</b>	Very Good		
<b>Disturbance:</b>	Weeds		
<b>Fire Age</b>	Old		

**Other Relevant Information:** Unsuitable habitat for Western Pebble-mound Mouse.

# APPENDIX J

# FLORA INVENTORY

## APPENDIX J

## SPECIES LIST

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
ACANTHACEAE	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	X	X
AMARANTHACEAE	<i>Alternanthera nana</i>		X
AMARANTHACEAE	<i>Ptilotus astrolasius</i> var. <i>astrolasius</i>	X	X
AMARANTHACEAE	<i>Ptilotus calostachyus</i>	X	X
AMARANTHACEAE	<i>Ptilotus clementii</i>		X
AMARANTHACEAE	<i>Ptilotus exaltatus</i>	X	X
AMARANTHACEAE	<i>Ptilotus obovatus</i>	X	X
AMARANTHACEAE	<i>Ptilotus polystachyus</i>	X	X
AMARANTHACEAE	<i>Ptilotus rotundifolius</i>	X	X
AMARANTHACEAE	<i>Ptilotus schwartzii</i> var. <i>georgei</i>	X	
ASCLEPIADACEAE	<i>Marsdenia australis</i>	X	
ASCLEPIADACEAE	<i>Rhyncharrhena linearis</i>		X
ASCLEPIADACEAE	<i>Sarcostemma viminale</i> subsp. <i>australe</i>	X	X
ASTERACEAE	* <i>Bidens bipinnata</i>	X	X
ASTERACEAE	<i>Chrysocephalum apiculatum</i>	X	X
ASTERACEAE	<i>Chrysocephalum pterochaetum</i>		X
ASTERACEAE	<i>Peripleura arida</i>	X	X
ASTERACEAE	<i>Pluchea dentex</i>		X
ASTERACEAE	<i>Pluchea</i> sp.		X
ASTERACEAE	<i>Pterocaulon sphaeranthoides</i>	X	X
ASTERACEAE	<i>Rutidosia helichrysoides</i>	X	X
ASTERACEAE	<i>Streptoglossa bubakii</i>	X	X
BORAGINACEAE	<i>Halgania cyanea</i> var. Allambi Stn (B.W. Strong 676)	X	X
BORAGINACEAE	<i>Heliotropium inexplicitum</i>		X
BORAGINACEAE	<i>Heliotropium pachyphyllum</i>		X
BORAGINACEAE	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	X	X
BRASSICACEAE	<i>Lepidium pedicellosum</i>		X
CAPPARACEAE	<i>Capparis lasiantha</i>	X	X
CAPPARACEAE	<i>Cleome viscosa</i>	X	X
CARYOPHYLLACEAE	<i>Polycarpaea longiflora</i>	X	X
CELASTRACEAE	<i>Maytenus</i> sp. Mt Windell		X
CELASTRACEAE	<i>Stackhousia muricata</i>	X	
CHENOPODIACEAE	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	X	
CHENOPODIACEAE	<i>Enchylaena tomentosa</i>	X	X
CHENOPODIACEAE	<i>Maireana georgei</i>	X	X
CHENOPODIACEAE	<i>Maireana planifolia</i>	X	
CHENOPODIACEAE	<i>Maireana tomentosa</i>		X
CHENOPODIACEAE	<i>Maireana triptera</i>		X
CHENOPODIACEAE	<i>Maireana villosa</i>		X
CHENOPODIACEAE	<i>Rhagodia eremaea</i>	X	X
CHENOPODIACEAE	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	X	X

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
CHENOPODIACEAE	<i>Salsola tragus</i>	X	X
CHENOPODIACEAE	<i>Salsola tragus</i> subsp. <i>grandiflora</i>		X
CHENOPODIACEAE	<i>Salsola tragus</i> subsp. <i>tragus</i>	X	
CHENOPODIACEAE	<i>Sclerolaena cornishiana</i>	X	X
CHENOPODIACEAE	<i>Sclerolaena costata</i>	X	
CHENOPODIACEAE	<i>Sclerolaena densiflora</i>	X	X
CHENOPODIACEAE	<i>Tecticornia auriculata</i>		X
CHENOPODIACEAE	<i>Tecticornia</i> sp.		X
CHLOANTHACEAE	<i>Dicrastylis cordifolia</i>	X	
CONVOLVULACEAE	<i>Bonamia rosea</i>	X	X
CONVOLVULACEAE	<i>Duperreya commixta</i>	X	X
CONVOLVULACEAE	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	X	X
CONVOLVULACEAE	<i>Ipomoea muelleri</i>		X
CONVOLVULACEAE	<i>Polymeria ambigua</i>		X
CUCURBITACEAE	<i>Cucumis maderaspatanus</i>	X	X
CYPERACEAE	<i>Bulbostylis barbata</i>		X
CYPERACEAE	<i>Cyperus bulbosus</i>		X
EUPHORBIACEAE	<i>Euphorbia</i> ? <i>coghlanii</i>		X
EUPHORBIACEAE	<i>Euphorbia australis</i>	X	X
EUPHORBIACEAE	<i>Euphorbia coghlanii</i>		X
EUPHORBIACEAE	<i>Euphorbia</i> sp.	X	
EUPHORBIACEAE	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		X
EUPHORBIACEAE	<i>Phyllanthus maderaspatensis</i>	X	X
FABACEAE	<i>Acacia acradenia</i>	X	
FABACEAE	<i>Acacia adoxa</i> var. <i>adoxo</i>	X	X
FABACEAE	<i>Acacia adsurgens</i>	X	X
FABACEAE	<i>Acacia</i> aff. <i>adsurgens</i>		X
FABACEAE	<i>Acacia ancistrocarpa</i>	X	X
FABACEAE	<i>Acacia aneura</i>	X	
FABACEAE	<i>Acacia aneura</i> var. ? <i>aneura/intermedia</i>	X	
FABACEAE	<i>Acacia aneura</i> var. <i>aneura</i>	X	X
FABACEAE	<i>Acacia aneura</i> var. <i>conifera</i>	X	X
FABACEAE	<i>Acacia aneura</i> var. <i>intermedia</i>		X
FABACEAE	<i>Acacia aneura</i> var. <i>major</i>		X
FABACEAE	<i>Acacia aneura</i> var. <i>microcarpa</i>		X
FABACEAE	<i>Acacia aneura</i> var. <i>pilbarana</i>		X
FABACEAE	<i>Acacia atkinsiana</i>	X	X
FABACEAE	<i>Acacia ayersiana</i>	X	X
FABACEAE	<i>Acacia bivenosa</i>	X	X
FABACEAE	<i>Acacia catenulata</i>	X	
FABACEAE	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>		X
FABACEAE	<i>Acacia citrinoviridis</i>	X	X
FABACEAE	<i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>	X	
FABACEAE	<i>Acacia dictyophleba</i>		X
FABACEAE	<i>Acacia distans</i>	X	X
FABACEAE	<i>Acacia elachantha</i>		X



FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
FABACEAE	<i>Acacia eriopoda</i>	X	
FABACEAE	<i>Acacia hamersleyensis</i>		X
FABACEAE	<i>Acacia hilliana</i>		X
FABACEAE	<i>Acacia inaequilatera</i>	X	X
FABACEAE	<i>Acacia kempeana</i>	X	X
FABACEAE	<i>Acacia macraneura</i>	X	
FABACEAE	<i>Acacia maitlandii</i>	X	X
FABACEAE	<i>Acacia marramamba</i>	X	X
FABACEAE	<i>Acacia monticola</i>	X	X
FABACEAE	<i>Acacia orthocarpa</i>	X	
FABACEAE	<i>Acacia pachyacra</i>	X	X
FABACEAE	<i>Acacia paraneura</i>		X
FABACEAE	<i>Acacia pruinocarpa</i>	X	X
FABACEAE	<i>Acacia pyrifolia</i>		X
FABACEAE	<i>Acacia rhodophloia</i>	X	X
FABACEAE	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	X	X
FABACEAE	<i>Acacia sibilans</i>		X
FABACEAE	<i>Acacia sibirica</i>	X	X
FABACEAE	<i>Acacia sp.</i>	X	
FABACEAE	<i>Acacia sphaerostachya</i>	X	
FABACEAE	<i>Acacia steedmanii</i> subsp. <i>borealis</i>		X
FABACEAE	<i>Acacia subtiliformis</i>		X
FABACEAE	<i>Acacia synchronicia</i>	X	X
FABACEAE	<i>Acacia tenuissima</i>	X	X
FABACEAE	<i>Acacia tetragonophylla</i>	X	X
FABACEAE	<i>Acacia trudgeniana</i>		X
FABACEAE	<i>Acacia tumida</i> var. <i>pilbarensis</i>	X	X
FABACEAE	<i>Acacia victoriae</i>	X	
FABACEAE	<i>Cullen leucanthum</i>		X
FABACEAE	<i>Gastrolobium grandiflorum</i>		X
FABACEAE	<i>Glycine canescens</i>		X
FABACEAE	<i>Indigofera georgei</i>	X	X
FABACEAE	<i>Indigofera gilesii</i> subsp. <i>gilesii</i>		X
FABACEAE	<i>Indigofera monophylla</i>		X
FABACEAE	<i>Isotropis forrestii</i>		X
FABACEAE	<i>Mirbelia viminalis</i>	X	X
FABACEAE	<i>Petalostylis labicheoides</i>	X	X
FABACEAE	<i>Rhynchosia minima</i>	X	X
FABACEAE	<i>Senna artemisioides</i> subsp. <i>artemisioides</i>	X	X
FABACEAE	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	X	X
FABACEAE	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	X	X
FABACEAE	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>helmsii</i>		X
FABACEAE	<i>Senna artemisioides</i> subsp. <i>stricta</i>	X	
FABACEAE	<i>Senna ferraria</i>	X	X
FABACEAE	<i>Senna ferraria</i> x <i>glaucifolia</i>		X
FABACEAE	<i>Senna glaucifolia</i>		X

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
FABACEAE	<i>Senna glutinosa</i>	X	
FABACEAE	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i>		X
FABACEAE	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	X	X
FABACEAE	<i>Senna glutinosa</i> subsp. <i>luerssenii</i>	X	X
FABACEAE	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	X	X
FABACEAE	<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>		X
FABACEAE	<i>Senna notabilis</i>	X	
FABACEAE	<i>Senna pleurocarpa</i> var. <i>angustifolia</i>	X	X
FABACEAE	<i>Senna sericea</i>	X	X
FABACEAE	<i>Senna stricta</i>		X
FABACEAE	<i>Senna symonii</i>	X	
FABACEAE	<i>Tephrosia rosea</i> var. <i>glabrior</i>		X
FABACEAE	<i>Tephrosia</i> sp. Cathedral Gorge (F.H. Mollemans 2420)		X
FABACEAE	<i>Vigna lanceolata</i> var. <i>lanceolata</i>		X
GOODENIACEAE	<i>Brunonia australis</i>	X	
GOODENIACEAE	<i>Dampiera candicans</i>	X	X
GOODENIACEAE	<i>Goodenia lamprosperma</i>		X
GOODENIACEAE	<i>Goodenia microptera</i>		X
GOODENIACEAE	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	X	X
GOODENIACEAE	<i>Goodenia stellata</i>		X
GOODENIACEAE	<i>Goodenia stobbsiana</i>	X	X
GOODENIACEAE	<i>Goodenia triodiophila</i>		X
GOODENIACEAE	<i>Scaevola amblyanthera</i> var. <i>centralis</i>	X	
GOODENIACEAE	<i>Scaevola browniana</i> subsp. <i>browniana</i>	X	X
GOODENIACEAE	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	X	X
GOODENIACEAE	<i>Scaevola spinescens</i>		X
GOODENIACEAE	<i>Scaevola spinescens</i> (broad form)		X
GYROSTEMONACEAE	<i>Codonocarpus cotinifolius</i>	X	X
HALORAGACEAE	<i>Haloragis gossei</i> var. <i>gossei</i>	X	X
LAMIACEAE	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>		X
LAMIACEAE	<i>Prostanthera albiflora</i>		X
LAMIACEAE	<i>Spartothamnella teucriflora</i>		X
LAURACEAE	<i>Cassytha capillaris</i>	X	
MALVACEAE	<i>Abutilon cryptopetalum</i>		X
MALVACEAE	<i>Abutilon cunninghamii</i>		X
MALVACEAE	<i>Abutilon fraseri</i>	X	X
MALVACEAE	<i>Abutilon lepidum</i>	X	
MALVACEAE	<i>Abutilon macrum</i>	X	
MALVACEAE	<i>Abutilon otocarpum</i>	X	X
MALVACEAE	<i>Corchorus incanus</i> subsp. <i>lithophilus</i>	X	
MALVACEAE	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>		X
MALVACEAE	<i>Corchorus</i> sp. Hamersley Range (S. van Leeuwen 3586)	X	
MALVACEAE	<i>Corchorus tridens</i>		X
MALVACEAE	<i>Gossypium australe</i>	X	X
MALVACEAE	<i>Gossypium robinsonii</i>	X	X

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
MALVACEAE	<i>Gossypium sturtianum</i>		X
MALVACEAE	<i>Gossypium sturtianum</i> var. <i>sturtianum</i>	X	X
MALVACEAE	<i>Hibiscus austrinus</i> var. <i>austrinus</i>	X	
MALVACEAE	<i>Hibiscus burtonii</i>	X	X
MALVACEAE	<i>Hibiscus haynaldii</i>		X
MALVACEAE	<i>Hibiscus</i> sp.	X	
MALVACEAE	<i>Hibiscus sturtii</i>	X	
MALVACEAE	<i>Hibiscus sturtii</i> var. ? <i>campylochlamys</i>		X
MALVACEAE	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	X	X
MALVACEAE	<i>Keraudrenia nephrosperma</i>		X
MALVACEAE	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	X	X
MALVACEAE	* <i>Malvastrum americanum</i>		X
MALVACEAE	<i>Rulingia loxophylla</i>		X
MALVACEAE	<i>Rulingia luteiflora</i>	X	X
MALVACEAE	<i>Sida</i> aff. <i>fibulifera</i>	X	X
MALVACEAE	<i>Sida arenicola</i>	X	X
MALVACEAE	<i>Sida cardiophylla</i>		X
MALVACEAE	<i>Sida clementii</i>	X	
MALVACEAE	<i>Sida ectogama</i>	X	X
MALVACEAE	<i>Sida fibulifera</i>		X
MALVACEAE	<i>Sida pilbarensis</i> (ferruginous form)		X
MALVACEAE	<i>Sida rohlena</i>	X	
MALVACEAE	<i>Sida</i> sp.		X
MALVACEAE	<i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260)	X	
MALVACEAE	<i>Sida</i> sp. <i>Excedentifolia</i> (J.L. Egan 1925)	X	X
MALVACEAE	<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	X	X
MALVACEAE	<i>Sida</i> sp. <i>Shovelanna Hill</i> (S. van Leeuwen 3842)	X	
MALVACEAE	<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)		X
MARSILEACEAE	<i>Marsilea hirsuta</i>		X
MOLLUGINACEAE	<i>Mollugo molluginea</i>	X	
MORACEAE	<i>Ficus brachypoda</i>		X
MYOPORACEAE	<i>Eremophila cuneifolia</i>	X	X
MYOPORACEAE	<i>Eremophila exilifolia</i>	X	X
MYOPORACEAE	<i>Eremophila forrestii</i>	X	
MYOPORACEAE	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	X	X
MYOPORACEAE	<i>Eremophila forrestii</i> x <i>latrobei</i>		X
MYOPORACEAE	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	X	X
MYOPORACEAE	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	X	X
MYOPORACEAE	<i>Eremophila lanceolata</i>		X
MYOPORACEAE	<i>Eremophila latrobei</i> subsp. aff. <i>filiformis</i>	X	
MYOPORACEAE	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	X	X
MYOPORACEAE	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>		X
MYOPORACEAE	<i>Eremophila latrobei</i> x <i>forrestii</i>		X
MYOPORACEAE	<i>Eremophila longifolia</i>	X	X
MYOPORACEAE	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>		X
MYOPORACEAE	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>		X

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
MYOPORACEAE	<i>Eremophila phyllopoda</i> subsp. <i>obliqua</i>	X	X
MYOPORACEAE	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>		X
MYOPORACEAE	<i>Eremophila</i> sp.	X	
MYRTACEAE	<i>Calytrix carinata</i>		X
MYRTACEAE	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	X	X
MYRTACEAE	<i>Corymbia ferritcola</i>	X	X
MYRTACEAE	<i>Corymbia hamersleyana</i>	X	X
MYRTACEAE	<i>Corymbia</i> sp.	X	
MYRTACEAE	<i>Eucalyptus camaldulensis</i> subsp. <i>obtusata</i>	X	
MYRTACEAE	<i>Eucalyptus gamophylla</i>	X	X
MYRTACEAE	<i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i>	X	X
MYRTACEAE	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	X	X
MYRTACEAE	<i>Eucalyptus lucasii</i>	X	
MYRTACEAE	<i>Eucalyptus pilbarensis</i>	X	X
MYRTACEAE	<i>Eucalyptus repullulans</i>		X
MYRTACEAE	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	X	X
MYRTACEAE	<i>Eucalyptus</i> sp.	X	
MYRTACEAE	<i>Eucalyptus trivalva</i>	X	X
MYRTACEAE	<i>Eucalyptus victrix</i>	X	X
MYRTACEAE	<i>Eucalyptus xerothermica</i>	X	X
MYRTACEAE	<i>Gompholobium</i> sp. Pilbara (N.F. Norris 908)	X	X
MYRTACEAE	<i>Melaleuca eleuterostachya</i>	X	X
NYCTAGINACEAE	<i>Boerhavia coccinea</i>	X	
NYCTAGINACEAE	<i>Boerhavia gardneri</i>	X	
OLEACEAE	<i>Jasminum didymum</i> subsp. <i>lineare</i>	X	X
PITOSPORACEAE	<i>Pittosporum angustifolium</i>	X	
POACEAE	<i>Amphipogon sericeus</i>	X	X
POACEAE	<i>Amphipogon sericeus</i> (Newman form BR2-21)	X	X
POACEAE	<i>Aristida contorta</i>	X	X
POACEAE	<i>Aristida holathera</i>	X	X
POACEAE	<i>Aristida holathera</i> var. <i>holathera</i>	X	X
POACEAE	<i>Aristida ingrata</i>	X	X
POACEAE	<i>Aristida latifolia</i>	X	
POACEAE	<i>Aristida</i> sp.	X	X
POACEAE	<i>Cenchrus ciliaris</i>	X	
POACEAE	<i>Chrysopogon fallax</i>	X	X
POACEAE	<i>Cymbopogon ambiguus</i>		X
POACEAE	<i>Cymbopogon obtectus</i>	X	X
POACEAE	<i>Cymbopogon</i> sp.	X	X
POACEAE	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	X	
POACEAE	<i>Digitaria ammophila</i>	X	
POACEAE	<i>Digitaria brownii</i>		X
POACEAE	<i>Enneapogon caerulescens</i>	X	X
POACEAE	<i>Enneapogon intermedius</i>	X	
POACEAE	<i>Enneapogon lindleyanus</i>	X	X
POACEAE	<i>Enneapogon polyphyllus</i>	X	

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
POACEAE	<i>Eragrostis eriopoda</i>	X	X
POACEAE	<i>Eragrostis leptocarpa</i>	X	
POACEAE	<i>Eriachne flaccida</i>		X
POACEAE	<i>Eriachne helmsii</i>		X
POACEAE	<i>Eriachne lanata</i>		X
POACEAE	<i>Eriachne mucronata</i>	X	X
POACEAE	<i>Eriachne obtusa</i>	X	
POACEAE	<i>Eriachne pulchella</i> subsp. <i>dominii</i>		X
POACEAE	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>	X	
POACEAE	<i>Eriachne</i> sp.	X	
POACEAE	<i>Eriachne tenuiculmis</i>		X
POACEAE	<i>Eulalia aurea</i>	X	X
POACEAE	<i>Panicum</i> sp.	X	
POACEAE	<i>Paraneurachne muelleri</i>	X	X
POACEAE	<i>Paspalidium clementii</i>	X	
POACEAE	<i>Setaria dielsii</i>	X	
POACEAE	<i>Setaria surgens</i>	X	
POACEAE	<i>Sporobolus australasicus</i>	X	
POACEAE	<i>Themeda triandra</i>	X	X
POACEAE	<i>Triodia</i> aff. <i>basedowii</i>		X
POACEAE	<i>Triodia angusta</i>	X	X
POACEAE	<i>Triodia basedowii</i>	X	
POACEAE	<i>Triodia brizoides</i>		X
POACEAE	<i>Triodia epactia</i>	X	
POACEAE	<i>Triodia lanigera</i>	X	
POACEAE	<i>Triodia melvillei</i>	X	X
POACEAE	<i>Triodia pungens</i>		X
POACEAE	<i>Triodia secunda</i>	X	
POACEAE	<i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835)	X	X
POACEAE	<i>Triodia wiseana</i>	X	X
PROTEACEAE	<i>Grevillea berryana</i>	X	X
PROTEACEAE	<i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i>	X	
PROTEACEAE	<i>Grevillea stenobotrya</i>	X	
PROTEACEAE	<i>Grevillea striata</i>		X
PROTEACEAE	<i>Grevillea wickhamii</i>		X
PROTEACEAE	<i>Grevillea wickhamii</i> subsp. <i>macrodonta</i>	X	
PROTEACEAE	<i>Hakea chordophylla</i>	X	X
PROTEACEAE	<i>Hakea lorea</i> subsp. <i>lorea</i>	X	X
PROTEACEAE	<i>Hakea preissii</i>		X
PTERIDACEAE	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	X	X
RHAMNACEAE	<i>Cryptandra monticola</i>	X	
RUBIACEAE	<i>Oldenlandia crouchiana</i>	X	
RUBIACEAE	<i>Oldenlandia galioides</i>	X	
RUBIACEAE	<i>Psydrax latifolia</i>	X	X
RUBIACEAE	<i>Psydrax suaveolens</i>	X	X
SANTALACEAE	<i>Anthobolus leptomerioides</i>	X	X

FAMILY	NAME	ENV 2007 SURVEY	CURRENT SURVEY (2010)
SANTALACEAE	<i>Exocarpos sparteus</i>		X
SANTALACEAE	<i>Santalum lanceolatum</i>	X	X
SAPINDACEAE	<i>Diplopeltis stuartii</i> var. <i>stuartii</i>		X
SAPINDACEAE	<i>Dodonaea coriacea</i>	X	
SAPINDACEAE	<i>Dodonaea lanceolata</i> var. <i>lanceolata</i>	X	X
SAPINDACEAE	<i>Dodonaea pachyneura</i>	X	X
SAPINDACEAE	<i>Dodonaea petiolaris</i>	X	X
SAPINDACEAE	<i>Dodonaea viscosa</i> subsp. <i>mucronata</i>		X
SOLANCEAE	<i>Solanum centrale</i>	X	X
SOLANCEAE	<i>Solanum horridum</i>		X
SOLANCEAE	<i>Solanum lasiophyllum</i>	X	X
SOLANCEAE	<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	X	X
SOLANCEAE	<i>Solanum phlomoides</i>	X	X
VIOLACEAE	<i>Hybanthus aurantiacus</i>		X
ZYGOPHYLLACEAE	<i>Tribulus suberosus</i>	X	X

# **APPENDIX K**

## **LOCATION OF PRIORITY FLORA**

## APPENDIX K

## LOCATION OF PRIORITY FLORA

Taxa	Site Number	# Easting	# Northing
<i>Acacia subtiliformis</i> (P3)	OP27	728770	7423630
	OPOPCS01	727653	7423288
	OPOPCS02	727717	7423276
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) (P3)	OP07	728256	7423157
	OP40	732905	7422564
<i>Indigofera gilesii</i> subsp. <i>gilesii</i> (P3)	OP34	734596	7425708
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)	OP01	727487	7423551
	OP05	727698	7422591
	OP10	728755	7424913
	OP19	727598	7424441
	OPOPCS04	727594	7423985
	OPOPCS05	727583	7424013

# Australian Geocentric 1994 (GDA94), Zone 50K



# **APPENDIX L**

## **PRIORITY FLORA REPORT FORMS**

# Threatened and Priority Flora Report Form

Version 1.0 January 2000

Please complete as much of the form as possible, with emphasis on those sections denoted in **bold**.

TAXON: Acacia saligna TURL Rep No: \_\_\_\_\_  
 OBSERVATION DATE: 1995-20-0 CONSERVATION STATUS: R2 New population   
 OBSERVERS: Dina Hancock PHONE: 08 9262 3300  
 ROLE: Botanist ORGANIZATION: ENV Australia

DESCRIPTION OF LOCATION: See map  
 Site: See map  
 Section: On the edge of Range 40 on road to Newman, WA.

DEC DISTRICT: \_\_\_\_\_ LG: \_\_\_\_\_ Reserve No: \_\_\_\_\_  
 DAY: \_\_\_\_\_ COORDINATES: UTM  Decimal  Lat/Long   
 Dec Degrees:  Dec Min:  Lat: 30° 59' 40.758" S Method used: RPS  Other GPS   
 Long: 115° 01' 30.583" E No satellite: \_\_\_\_\_ Map: \_\_\_\_\_  
 Zone: 57 S Boundary polygon:  Map scale: \_\_\_\_\_

LEAD TENURE  
 Native title  Freehold  Trust property  RFL  State owned   
 Pastoral lease  State lease  Pastoral lease  LFL/leasehold  Other than reserve   
 Conservation  Public reserve  Other  Other  Other  Other  Other

AREA ASSESSMENT: Open  Urban  Rural  Area observed (ha): 20  
 EFFORT: Time spent surveying (minutes): 30 No. of photos spent (100m): \_\_\_\_\_

POPULATION ACCURACY: None  Imprecise  Estimate  Count method: \_\_\_\_\_  
 (Please advise count)

WHAT COUNTED: Flora  Spores  Germinants   
 TOTAL POPULATION: None Unknown Seedlings Totals  
 None: 0 Area of seed bank: \_\_\_\_\_  
 Seed: \_\_\_\_\_ Seed bank: \_\_\_\_\_  
 (See field notes for details on population)

QUADRATS PRESENT: No. 1 Size: 50 x 20m Stage: Other  Total area of quadrats (m<sup>2</sup>): 50

REPRODUCTIVE STATE: Flora  Germinant  Seedling  Other   
Immature  Flt.  Established  Reproductive

CONDITION OF PLANTS: Healthy  Weak  Dead  Severely

COMMENT: \_\_\_\_\_

THREATS: Open, light and surrounding information.

Threat	Current impact (0-5)	Potential impact (0-5)	Potential threat score (0-1)
* Open	0	0	0
* Weak	0	M	X
* Unstable	X	M	S





# Threatened and Priority Flora Report Form

Version 1.0 January 2010

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface, eg grass, quartz links)	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Green <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Labrite <input type="checkbox"/>		Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	30-50% <input type="checkbox"/>	Flat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					
<b>CONDITION OF SOIL:</b>	Specify Landform Element _____ <small>(Please tick relevant to conditions noted)</small>				
	dry <input type="checkbox"/>	Wet <input type="checkbox"/>	Moist/sooty <input type="checkbox"/>	moist <input type="checkbox"/>	

## VEGETATION CLASSIFICATION:

Eg. 1. *Sarcoba* woodland (S. *viridata*, S. *viridifolia*)  
2. Open woodland  
(*Allocasuarina*, *Acacia* spp.)  
3. heath/clump of sedge  
(*Mitrasacme* spp.)

1. Open mallee of *Eucalyptus* *acridula* subsp. *acridula* and *E. populata*.
2. Low Open Shrubland of *Scaevola* *brodiaea* subsp. *brodiaea* and *Eremophila* *fulgens* subsp. *puberula*.
3. Hummock grassland of *Trichostema* *viridula* and *Trichostema* *brodiaea*.
4. \_\_\_\_\_

## ASSOCIATED SPECIES:

Other associated spp: \_\_\_\_\_

Please record up to four of the most representative vegetation types (with up to five dominant species in each) using Standard Hierarchical codes (http://www.australian.flora.net/). List 'Survey Field' numbers (optional) - refer to field manual for full instructions and structure format table.

<b>CONDITION OF HABITAT:</b>	Prone <input type="checkbox"/>	Excellent <input checked="" type="checkbox"/>	Very good <input type="checkbox"/>	Good <input type="checkbox"/>	Degraded <input type="checkbox"/>	Completely degraded <input type="checkbox"/>
<b>COMMENT:</b>	_____					
<b>FIRE HISTORY:</b>	Last Fire Season/Month _____	Year _____	Fire Intensity: High <input type="checkbox"/>	Medium <input type="checkbox"/>	Low <input type="checkbox"/>	No signs of fire <input type="checkbox"/>
<b>FENCING:</b>	Not required <input type="checkbox"/>	Present <input type="checkbox"/>	Requires repair <input type="checkbox"/>	Retained <input type="checkbox"/>	Length req'd: _____	
<b>ROADSIDE MARKERS:</b>	Not required <input type="checkbox"/>	Present <input type="checkbox"/>	Requires replacement <input type="checkbox"/>	Retained <input type="checkbox"/>	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.)

<b>SPECIMEN:</b>	Collectors No. _____	WA Herb. <input type="checkbox"/>	Queens Herb. <input type="checkbox"/>	District Herb. <input type="checkbox"/>	Other: _____	
<b>ATTACHED:</b>	Map <input type="checkbox"/>	Memos <input type="checkbox"/>	Photo <input type="checkbox"/>	GIS data <input type="checkbox"/>	Field notes <input type="checkbox"/>	Other: _____
<b>COPY SENT TO:</b>	Regional Office <input type="checkbox"/>	District Office <input type="checkbox"/>	Other: _____			





# Threatened and Priority Flora Report Form

Form 10 January 2000

Please complete as much of the form as possible, with emphasis on those sections bordered in black

TAXON	Grewia sp. East Pilbara (W.A. Native) PFD 727	TFL Ref. No.	
OBSERVATION DATE	15/05/2010	CONSERVATION STATUS	PS <input type="checkbox"/> New addition <input type="checkbox"/>
OCCUPYER(S)	Emma Gant Lane Rural Services	PHONE	89 3263 4350
RD No	State 3300 (and 4000)	ORGANISATION	EMV Australia

DESCRIPTION OF LOCATION			
Rout 1 of Gwynne Hwy - 45 km West of Newman, WA			
REG. DISTRICT			Reserve No.
LGA:			<input type="checkbox"/>
DATE:	COORDINATES:	METHOD USED:	
	Sub-degree: <input type="checkbox"/> Degree: <input type="checkbox"/> UTM: <input checked="" type="checkbox"/> Easting: 7482157 Long. Easting: 762635 ZONE: 50+	GPS <input checked="" type="checkbox"/> Striped <input type="checkbox"/> Map <input type="checkbox"/> No. sites rec: _____    V10.000 Elevation (m): _____    V10.010 Datum: <input type="checkbox"/>	
GDS: + VDS: <input type="checkbox"/> MDC: + MGT: <input type="checkbox"/> WCE: <input type="checkbox"/> L: <input type="checkbox"/>			
LAND TENURE			
Nat. park: <input type="checkbox"/> Nat. reserve: <input type="checkbox"/> Conservation: <input type="checkbox"/>	Timber lease: <input type="checkbox"/> Grazing: <input type="checkbox"/> Other: <input type="checkbox"/>	Private property: <input type="checkbox"/> Pastoral lease: <input checked="" type="checkbox"/> Other: <input type="checkbox"/>	Public land: <input type="checkbox"/> Other: <input type="checkbox"/> Other: <input type="checkbox"/>

AREA ASSESSMENT			
Topo survey	<input type="checkbox"/>	Contour survey	<input type="checkbox"/>
Flora survey	<input checked="" type="checkbox"/>	Aerial coverage (m)	20
EFFORT		No. of minutes spent (10 min)	
Time spent surveying (min): 20			
POP. COUNT ACCURACY: Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input checked="" type="checkbox"/> Count method: _____			
WHAT COUNTED:	Pods <input checked="" type="checkbox"/>	Canes <input type="checkbox"/>	Can't count <input type="checkbox"/>
TOTAL POP. EST. (NONE)	Millie	June West	Seedlings    Pollen:
Area	1000-		Area of poll. (m <sup>2</sup> ): _____
NO			No. flowers per poll. (m <sup>2</sup> ): _____
QUADRATS PRESENT:	No. 1	Size 60x30m	Dist. between <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____
REPRODUCTION STATUS:			
Flowering	<input type="checkbox"/>	Vegetative	<input checked="" type="checkbox"/>
Seedling	<input type="checkbox"/>	Pod	<input type="checkbox"/>
Collected	<input type="checkbox"/>	Other	<input type="checkbox"/>
CONDITION OF PLANTS: Healthy <input type="checkbox"/> Wounded <input checked="" type="checkbox"/> Dead <input type="checkbox"/> Stunted <input type="checkbox"/>			

COMMENT: \_\_\_\_\_

THREATS - type, agent and supporting information:	Current Impact (M/E)	Potential Impact (M/E)	Proposed Threat Control (M/E)
• Clearing	=	1	1
• Weeds	=	1	1
• Livestock	V	2	2

Please return completed form to DEC, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6963  
 RECORDS: From forwarding Administrative Officer, Flora, Species and Communities Branch  
 Record entered by: \_\_\_\_\_    Date: \_\_\_\_\_    Record Entered in Database: \_\_\_\_\_





# Threatened and Priority Flora Report Form

Version 3 January 2010

Please complete as much of the form as possible, with emphasis on those sections bordered in black

**TAXON:** Gonolobus sp. East Tuarta (A.A. Mireid) PR7727 **TRFL Pap. No.** \_\_\_\_\_  
**OBSERVATION DATE:** 10/05/2010 **CONSERVATION STATUS:** P3 New population   
**OBSERVERS:** Emma Carroll **PHONE:** 08 9208 8380  
**ROUTE:** Spring Road **ORGANISATION:** DCWA/Agencia

**DESCRIPTION OF LOCATION:** Spring Road, East Tuarta, 45 km West of Newman, WA.

**DEC DISTRICT:** \_\_\_\_\_ **GA:** \_\_\_\_\_ **Reserve No.** \_\_\_\_\_  
**DATUM:** WGS84 **COORDINATES:** 32°42'00" S 115°45'00" E **METHOD USED:** GPS  Differential GPS  Map   
24°42'00" S **Lat/Morning:** 115°45'00" E **Map Grid:** \_\_\_\_\_  
115°45'00" E **Long/Evening:** 32°42'00" S **Country/State:** WA **Map Scale:** \_\_\_\_\_  
**ZONE:** 30X  
**LAND USE:**  
 Rangeland  Pasture  Forest  Riparian  Shrubland   
 Wetland  Suburb  Pasture  Mine  Other  Other   
 Other  Other  Other  Other  Other  Other  Other

**AREA ASSESSMENT:** Edge  Partial  Full  Area assessed 100%  
**EFFORT:** Time spent surveying 30 minutes **No. of things counted** \_\_\_\_\_  
**FORM COUNT ACCURACY:** Actual  Secondary  Estimate  Counting method \_\_\_\_\_  
**WHAT COUNTED:** Plants  Clumps  Germinating   
**TOTAL FORM STRUCTURE:**

Wetland	_____	_____	_____	_____
Forest	_____	_____	_____	_____

**Area of each type** \_\_\_\_\_  
**QUADRATS PRESENT:** 10 **Rep. 50%** **Observed**  **Total area of quadrats** \_\_\_\_\_  
**Summary Quad Total:** 10  
**PROSPECTIVE STATUS:** Extinct  Extinct  Extinct  Extinct   
Extinct  Extinct  Extinct  Extinct

**CONDITION OF PLANTS:** Healthy  Recovered  Poor  Severely Poor   
**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current (0-6)	Potential (0-6)	Total Threat (0-6)
• <u>None</u>	0	0	0
• <u>None</u>	0	0	0
• <u>None</u>	0	0	0

# Threatened and Priority Flora Report Form

Version 1.0 January 2010

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(or soil matrix eg gravel, quartz, silt)	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dalrieta <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Lateite <input type="checkbox"/>		Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	30-50% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Ground depression <input type="checkbox"/>	<b>Specific Landham Element:</b>				
Wetland <input type="checkbox"/>	(Refer to field notes for additional codes)				
<b>CONDITION OF SOIL:</b>	Dry <input type="checkbox"/>	Moist <input type="checkbox"/>	Wet/soggy <input type="checkbox"/>	Inundated <input type="checkbox"/>	

## VEGETATION CLASSIFICATION:

Eg 1. Granite woodland (E. affinis, E. boroni)  
2. Open woodland (M. lewisii, A. acuminata)  
3. Inundated clump of sedge (M. lewisii, A. acuminata)

1. Open woodland of Eucalyptus scottii subsp. occidentalis and E. rugulosa.
2. Low Open Shrubland of Scaevola browniana subsp. browniana and Eriosema (juvencu subsp. pulcherrima).
3. Hummock grassland of Triodia weinera and Triodia stricta.
- 4.

## ASSOCIATED SPECIES:

Other (not declared): \_\_\_\_\_

Please record up to four of the most conspicuous species (with height and flowering time) and any other notable species (with height). Practical information should follow 2008 Australian Soil and Land Survey Field Handbook guidelines - refer to field manual for further information on data collection and recording.

**CONDITION OF HABITAT:** Pristine  Excised  Very poor  Good  Degraded  Completely degraded

## COMMENT:

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  Fire signs of fire

**FENCING:** Not required  Required  Fence location: \_\_\_\_\_ Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Required  Marker location: \_\_\_\_\_ 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 obtain it):

**SPECIMEN:** Collector's No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Map/Map  Photo  GPS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

# Threatened and Priority Flora Report Form

Version 1.0 January 2010

Please complete as much of the form as possible, with emphasis on those sections bordered in black

TAXON: Ingyersia gracilis (Prolegia) TFFL Fop. No. \_\_\_\_\_  
 OBSERVATION DATE: 16 Jul 2010 CONSERVATION STATUS: H3 New spp. record   
 OBSERVERS: Emily Condit and Bridget Watkins PHONE: 08 9581 6190  
 ROLE: Senior Botanist and Botanist ORGANISATION: ENV Australia

DESCRIPTION OF LOCATION: South of Optima to Rangy, 45 km West of Roaming WA  
 Reserve No: \_\_\_\_\_

COORDINATES: Zone: GWD UTM: X MGRS: UJG 600 000  
 UTM: 600 000 MGRS: UJG 600 000  
 Zone: GWD  
 Land Tenure:  Private  National  State  Local  Other   
 Native title  Pastoral lease  Other   
 Conservation  Other

AREA ASSESSMENT: Edge survey  Patch survey  Full survey  Area covered: 20  
 REPORT: True length survey (m): 30 No. of images spent: 30  
 POP COUNT ACCURACY:       
 WHAT COUNTED:      
 TOTAL POP STRUCTURE: 1 0 0 0 0  
 QUADRATS PRESENT: 1 0 0 0 0  
 REPRODUCTION STATE:

CONDITION OF PLANTS:      
 COMMENT: \_\_\_\_\_

THREATS - type, agent and suggested mitigation	Current impact (0-4)	Potential impact (0-4)	Priority (1-4)
+ <u>Climate</u>	1	3	1
+ <u>Woods</u>	1	2	2
+ <u>Overstock</u>	2	3	3

# Threatened and Priority Flora Report Form

Version 1.0 January 2010

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface eg gravel, quartz rubble)	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laraine <input type="checkbox"/>		Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Gay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	50-80% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	90-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>	Specific Landform Element (Refer to field notes with site no. and date)				
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION:**

Eg 1. *Banksia occidentalis* ssp. *occidentalis*, *S. imbricata*  
 2. Open shrubland  
 3. Inundated coastal plain  
 4. Inundated coastal plain

- Low woodland of *Eucalyptus leucoxylon* ssp. *leucoxylon* and *Gerygone densiflora*.
- Low Open Shrubland of *Scoparia brownii* ssp. *brownii* and *Bromophila juncea* ssp. *poliochrysa*.
- Hummock grassland of *Trichostema* ssp. and *Trichostema* ssp.
- 

**ASSOCIATED SPECIES:**

Other (non-dominant) spp: \_\_\_\_\_

Please record as far as possible the most representative vegetation layer with up to three dominant species in each layer. Structure Formations should include 200m diameter hole and Level 1 canopy photo (see field guidelines - refer to field manual and CD) taken on the same site as the site.

**CONDITION OF HABITAT:** Prime  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  Fences repair  Repaired  Length (m): \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Fences repaired  Repaired  Quantity (kg): \_\_\_\_\_

**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.)

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**SPECIMENS:** Collector No: \_\_\_\_\_ WA Herb  Regional Herb  District Herb  Other: \_\_\_\_\_

**ATTACHED:** Map  Midmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

# Threatened and Priority Flora Report Form

Version 1.0 January 2003

Please complete as much of the form as possible, with emphasis on those sections bordered in blue.

**TAXON:** Phacelia sp. (H. Gray) W. Tugger (1976) Pop. No. \_\_\_\_\_  
**OBSERVATION DATE:** 5/28/2010 **CONSERVATION STATUS:** P3 New pop. yr.   
**OBSERVERS:** Anna Smith and Cliff Sigmond **PHONE:** 253 262 0351  
**ROLE:** Smith: Data Collector **ORGANIZATION:** Washington

**DESCRIPTION OF LOCATION:** South of Spring and Punge 45 km West of Newman, WA

**DESCRIPTOR:** Herb Flowering No. \_\_\_\_\_  
**DATE:** \_\_\_\_\_ Leaf management   
**COORDINATES:** 17° 36' 00" N 122° 00' 00" W **METHODS:** GIS  Other GPS  Map   
GPS Dependent  Logfile  Other   
**WGS84 LONG:** 122° 00' 00" **BOUNDARY DESIGNATED:** \_\_\_\_\_ **MAP SCALE:** \_\_\_\_\_  
**WGS84 LAT:** 17° 36' 00" **BOUNDARY DESIGNATED:** \_\_\_\_\_ **MAP SCALE:** \_\_\_\_\_  
**ZONE:** 50 N  
**LAND USE:**  
 Agricultural  Other  Private property  Public  State/county owned   
 Wooded  Shrubland  Rangeland  MRA  Other   
 Contaminated  Water  Other  Other  **Inventory Method:** Barcode

**AREA ASSESSMENT:** Edge  Full  Not Surveyed  Area assessed only   
**EFFORT:** Time spent surveying (minutes): 20 No. of minutes per 100 m<sup>2</sup>: \_\_\_\_\_  
**POPULATION ADULTAGE:** Adult  Seedling  Estimate  Count method

**WHAT COUNTED:** Herb  Clump  Seedlings   
**TOTAL COUNT STRUCTURES:** None Seeds: \_\_\_\_\_ Other: \_\_\_\_\_  
**Area:** 1 **Area assessed only:** \_\_\_\_\_  
**Date:** \_\_\_\_\_ **No. plants per 100 m<sup>2</sup> (estimate):** \_\_\_\_\_  
**QUADRATS PRESENT:** No 50 x 50 x 50 cm Detached  Top edge and ends (m): \_\_\_\_\_  
**Survey Date (m/d/yr):** \_\_\_\_\_  
**ADDITIONAL STATE:** Open  Vascular  Foliage  Flower   
Stem  Fruit  Root  Other  **Percentage of cover:** \_\_\_\_\_ %  
**CONDITION OF PLANTS:** Healthy  Stressed  Dead  Senescent

**COMMENT:** \_\_\_\_\_

THREATS (List threat and supporting information)	Current threat (Y/N)	Potential threat (Y/N)	Relative Threat Class (1-5)
* <u>Logging</u>	L	H	L
* <u>Fire</u>	L	L	M
* <u>Overgrazing</u>	M	Y	S

# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(or soil matrix; eg gravel quartz pebbles)	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Lalorite <input type="checkbox"/>		Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Total <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Fall <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	30-50% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					
<b>CONDITION OF SOIL:</b>	<b>Specific Landform Element:</b>				
	(Refer to field manual for abbreviated names)				
	Dry <input type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

**VEGETATION CLASSIFICATION:**

Eg 1. *Low Open Woodland of *Corymbia casosticta* subsp. *casosticta*.*  
 2. *High Open Shrubland of *Acacia stenoverda*, *Acacia axyrioides* and *Acacia anethula* var. *microcarpa*.*  
 3. *Scattered hummock grasses of *Trachypogon*.*  
 4. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (see attached map) \_\_\_\_\_

\* Please refer to the list of threatened vegetation communities and their constituent species in the list of 2000 Australian Soil and Land Use Survey Field Handbook published in 2004. Field records to be taken from this published handbook table 10.1.

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

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  Fire signs of fire

**FENCING:** Not required  Present  Fences / posts  Required  Length/m: \_\_\_\_\_

**ROADSIDE BARRIERS:** Not required  Present  Fences / posts  Required  Quantity/m: \_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SPECIMEN:** Collection 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: \_\_\_\_\_





# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	100% soil surface (eg quartz, quartzite)	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Lava/ta <input type="checkbox"/>		Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Total <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	30-50% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**Specific Landform Element:**  
(Please tick boxes for all that apply)

Dry  Moist  Waterlogged  Inundated

**CONDITION OF SOIL:**

**VEGETATION CLASSIFICATION:**

1. High Open Shrubland of *Acacia chinensis*, *Acacia aysoniana* and *Acacia aneura* var. *microcarpa*.

2. Scattered hummock grasses of *Triodia multifida*.

3. \_\_\_\_\_

4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (see comment) sp: \_\_\_\_\_

Please record up to four of the most representative species in every tick spot that contains species in each type. Structural Formations should follow 2008 Australian Soil and Land Survey Field Handbook guidelines - note to tick instead of 'Other' categories and attached to notes field.

**CONDITION OF HABITAT:** Poor  Good  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**TENDING:** Not required  Present  Fences / water  Repair  Length road: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Fences / gates  Repair  Quantity herd: \_\_\_\_\_

**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.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SPECIMENS:** Collector's No: \_\_\_\_\_ WA Herb  Regional Herb  District Herb  Other: \_\_\_\_\_

**ATTACHED:** Map  Midmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_





# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/> Hill <input type="checkbox"/> Ridge <input type="checkbox"/> Outcrop <input type="checkbox"/> Slope <input type="checkbox"/> Flat <input type="checkbox"/> Open depression <input type="checkbox"/> Drainage line <input type="checkbox"/> Closed depression <input type="checkbox"/> Wetland <input type="checkbox"/>	Granite <input type="checkbox"/> Calcite <input type="checkbox"/> Limestone <input type="checkbox"/> Limestone <input checked="" type="checkbox"/> Limestone <input type="checkbox"/> Quartz <input checked="" type="checkbox"/> Specify other: _____ Specify Landform (if any): _____ (Please tick boxes for additional rock)	(on an average of gravel, quartz etc etc) 0-10% <input type="checkbox"/> 10-30% <input type="checkbox"/> 30-50% <input type="checkbox"/> 50-100% <input type="checkbox"/>	Sand <input type="checkbox"/> Sandy loam <input type="checkbox"/> Loam <input checked="" type="checkbox"/> Clay loam <input type="checkbox"/> Light clay <input type="checkbox"/> Peat <input type="checkbox"/> Specify other: _____	Red <input checked="" type="checkbox"/> Brown <input checked="" type="checkbox"/> Yellow <input type="checkbox"/> White <input type="checkbox"/> Grey <input type="checkbox"/> Black <input type="checkbox"/> Specify other: _____	Well drained <input type="checkbox"/> Seasonally inundated <input type="checkbox"/> Permanently inundated <input type="checkbox"/> Tidal <input type="checkbox"/>

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Saline

**VEGETATION CLASSIFICATION:**

Eg. 1. *Bankia ericoides* (s. stricta) B. B. (S. S.)  
 2. Open woodland  
 (Mulleberry, *Acacia* spp.)  
 3. Isolated clump of sedge  
 (Mulleberry ssp.)

1. Scattered Low Trees of *Corymba deserticola* subsp. *caerulescens*.  
 2. High Open Shrubland of *Acacia parramattensis* and *Acacia aneura* var. *microcarpa*  
 3. Grassland of *Trachypogon*  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**  
 Other (non-vascular): \_\_\_\_\_

Please record up to five of the most representative species (with up to five other rare species in each case). Standard Herbarium should follow 2009 Australian RFL and Land Survey Field Handbook guidelines - refer to the manual for further details and included floristic table.

**CONDITION OF HABITAT:** Prime  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  Broken / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Broken / repair  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.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Map  Photo  GPS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

# Threatened and Priority Flora Report Form

10/2008

Version 1.0 January 2010

Please complete as much of the form as possible, with emphasis on those sections bordered in black.

TAXON: Fraxinus sp. Hamata  Fraxinus 17764 TRFL Plan No: \_\_\_\_\_  
 OBSERVATION DATE: 15/05/10 CONSERVATION STATUS: PS New introduction:   
 GRSE NUMBER: 01010101 PHONE: 08 9226 5350  
 ROLE: Student ORGANISATION: University of Western Australia

DESCRIPTION OF LOCATION: Bentley Openland Range, 40 km West of Bentley, WA  
 Reserve No: \_\_\_\_\_

DEC DISTRICT: \_\_\_\_\_ LGA: \_\_\_\_\_ (if management) \_\_\_\_\_  
 DATUM: COORDINATES:  UTM  MGRS  UTM  MGRS  
 Lat: 32°05'S  Lat: 32°05'S METHOD USED:  GPS  Handheld GPS  Map   
 Long: 115°55'E  Long: 115°55'E No. species: \_\_\_\_\_ Monitored: \_\_\_\_\_  
 Zone: 30+ Estimated density: \_\_\_\_\_  
 LAND TENURE:  Public  Private  Other  Other  Other  Other  Other  
 State  Local  Other  Other  Other  Other

AREA ASSESSMENT:  Edge survey  Point survey  Full survey  Area assessed (m<sup>2</sup>): \_\_\_\_\_  
 EFFORT:  Field only (including transport)  No. of photos taken: 0  
 POP & COUNT ACCURACY:  None  Enumeration  Estimate  Count method: \_\_\_\_\_  
 WHAT COUNTED:  Plants  Stumps  Stand type: \_\_\_\_\_  
 TOTAL POP & STRUCTURES: None Stumps Seedlings Others  
 Area: 0 Area of occupancy: \_\_\_\_\_  
 Use: \_\_\_\_\_  
 QUADRATS PRESENT:  None  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  
 Summary Data Table: 

Area	Use

  
 REPRODUCTIVE STATE:  None  Vegetative  Flowering  Fruiting  Dormant  
 Immature  Adult  Germinating  Fruiting  Dormant

CONDITION OF PLANTS:  Healthy  Moderate  Poor  Damaged

COMMENT: \_\_\_\_\_

THREATS (Pop, Age, and seedling information)	Current Impact (0-5)	Potential Impact (0-5)	Regional Threat (0-5)
+ Clipping	0	1	1
+ Mowing	0	3	3
+ Livestock	1	3	3



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/> Hill <input type="checkbox"/> Ridge <input type="checkbox"/> Outcrop <input type="checkbox"/> Slope <input type="checkbox"/> Flat <input type="checkbox"/> Open depression <input type="checkbox"/> Drainage line <input type="checkbox"/> Closed depression <input type="checkbox"/> Wetland <input type="checkbox"/>	Granite <input type="checkbox"/> Dolomite <input type="checkbox"/> Limestone <input type="checkbox"/> Sandstone <input checked="" type="checkbox"/> Unconsolidated <input type="checkbox"/> Quartz <input checked="" type="checkbox"/> Specify other: _____ _____ _____ Specific Landform Element (Refer to field manual for additional options)	van der Laan type (eg gravel, quartz in soil) 0-10% <input type="checkbox"/> 10-30% <input type="checkbox"/> 30-50% <input type="checkbox"/> 50-100% <input type="checkbox"/> Specify other: _____ _____ _____	Sand <input type="checkbox"/> Sandy loam <input type="checkbox"/> Loam <input checked="" type="checkbox"/> Clay loam <input type="checkbox"/> Light clay <input type="checkbox"/> Peat <input type="checkbox"/> Specify other: _____ _____ _____	Red <input checked="" type="checkbox"/> Brown <input checked="" type="checkbox"/> Yellow <input type="checkbox"/> White <input type="checkbox"/> Grey <input type="checkbox"/> Black <input type="checkbox"/> Specify other: _____ _____ _____	Well drained <input type="checkbox"/> Seasonally inundated <input type="checkbox"/> Permanently inundated <input type="checkbox"/> Tidal <input type="checkbox"/>

**CONDITION OF SOIL:** Dry  Humid  Waterlogged  Hardened

**VEGETATION CLASSIFICATION:**  
 Eg. 1. Granite woodland (Eucalyptus, B. bicolor)  
 2. Open woodland (Melaleuca, Acacia spp.)  
 3. Inland dune woodland (Mimosa, Callitris)  
 4. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**ASSOCIATED SPECIES:**  
 Other (non-vascular) spp: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**CONDITION OF HABITAT:** Poor  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  Fences in repair  Requiring  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Fences in position  Requiring  Quantity req'd: \_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SPECIMEN:** Colourside No: \_\_\_\_\_ WA Herb  Regional Herb  District Herb  Other: \_\_\_\_\_

**ATTACHED:** Map  Midmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black

TAXON: Phragmites australis (L.) Trin. ex Steud. TPF Pop. No. \_\_\_\_\_  
 OBSERVATION DATE: 13/05/2010 CONSERVATION STATUS: P2 New sub. at loc.   
 OBSERVERS: CA & Rhyana PHONE: 08 9225 8350  
 ROLE: Barry ORGANISATION: ENV AUSTRALIA

DESCRIPTION OF LOCATION: South of Ophrysma Park, 45 km West of Newman, WA

DEC DISTRICT: \_\_\_\_\_ ZONE: 30 k Reserve No: \_\_\_\_\_  
 DATUM: \_\_\_\_\_ COORDINATES: UTM  GPS  Differential GPS  Map   
 DIMEN. NGADA  UTM  Lat. Nothing: 3294215 No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 LONG. NGADA  UTM  Long. Nothing: 127805 Country/region captured  No. used: \_\_\_\_\_  
 UTM  ZONE: 30 k  
 LAND TITLE: \_\_\_\_\_  
 TITLE NONE  No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 Conservation pop.  Water table: \_\_\_\_\_ No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_  
 No. of legs: \_\_\_\_\_ No. used: \_\_\_\_\_

AREA ASSESSMENT: Edge survey  Rd side survey  Full survey  Area assessed (m<sup>2</sup>): 50  
 EFFORT: Time taken surveying (minutes): 30 No. of photos taken (100 m): \_\_\_\_\_  
 POPN COUNT ACCURACY: Actual  Estimated  Estimate  Count method: \_\_\_\_\_  
 WHAT COUNTED: Plants  Cuttings  Core stems   
 TOTAL POPN STRUCTURE: Mature: \_\_\_\_\_ Juveniles: \_\_\_\_\_ Seedlings: \_\_\_\_\_ Total: \_\_\_\_\_  
 Alive: 2 Dead: \_\_\_\_\_  
 QUADRATS PRESENT: No. 1 Size 50 x 50 m Dist. and loc.  Total area of quadrats (m<sup>2</sup>): \_\_\_\_\_  
 Summary Road Table: None  
 REPRODUCTIVE STAGE: None  Vegetative  Fruiting  Flower   
 Fruiting  Fruiting  Fruiting  Fruiting

CONDITION OF PLANTS: Healthy  Stunted  None  Dead   
 COMMENT: \_\_\_\_\_

THREATS - type, age and supporting information	Current Impact (0-5)	Future Impact (0-5)	Priority (0-5)
* Grazing	1	1	1
* Weeds	1	1	1
* Logging	1	1	1



# Threatened and Priority Flora Report Form

Version 1.0 July 2010

Please complete as much of the form as possible, with emphasis on those sections bordered in black.

TAXON: Progelia sp. Hamata (ex. Traugott 1794) TPEL Ref: None  
 OBSERVATION DATE: 19/05/2010 CONSERVATION STATUS: R1 New population:   
 OBSERVERS: Emma Connel and Susan Behave PHONE: 08 8250 8250  
 ROLE: Self Collector and Botanist ORGANISATION: ENVIRONMENT

SEARCH REGION OR LOCATION: South of Cayultha Range 15 km west of Newman WA.

DEC DISTRICT: LSA Reserve No: None  
 DATUM: WGS84 COORDINATES:  UTM  MGRS  UTM Zone: 50Q METHOD USED:  GPS  Handheld GPS  Map   
 UTM Northing: 742358 No. photos: None Map scale: None  
 UTM Easting: 787487 Bound. point:  Map scale: None  
 ZONE: 50Q  
 LAND COVER:  Native forest  Pasture  Priority 2000   Other   
 Native grass  Salt marsh  Pasture   Other   
 Native shrub  Wet heath  LCP

AREA ASSESSMENT:  Edge survey  Initial survey  Full survey  Area assessed (m<sup>2</sup>): 22  
 EFFORT: Time spent (including commute): 20 No. of minutes spent: 20  
 POP COUNT ACCURACY:  Accurate  Approximate  Estimate  Count method: Visual  
 WHAT COUNTED:  Plants  Clones  Seedlings   

TOTAL POP STRUCTURE	Plants	Juveniles	Seedlings	Total
Area	<u>2</u>			
Count				

 CLONALS PRESENT:  No  Yes  Sex  Sexual  Dioecious  Total area of clonal (m<sup>2</sup>): None  
 REPRODUCTIVE STATE:  Dormant  Vegetative  Flowering  Fruiting   
 CONDITION OF PLANTS:  Healthy  Stunted  Poor  Damaged

COMMENT: None

THREATS (Type, sign, etc) AND supporting information	Current Impact (1-5)	Future Impact (1-5)	Regional Threat (1-5)
+ Clonal	L	L	L
+ No. 2	L	M	M
+ No. 10	M	M	5





# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	on soil surface eg piles, quartz rock	Sand <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input checked="" type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input checked="" type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	35-60% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input checked="" type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>	<b>Specify Landform Element:</b>				
Wetland <input type="checkbox"/>	(Please tick more than one if applicable)				

## CONDITION OF SOIL:

Dry  Moist  Waterlogged  Inundated

## VEGETATION

### CLASSIFICATION:

Eg. 1. Rankine woodland (E. strictum, E. nitidum)  
2. Open woodland  
(E. nitidum sp., Acacia spp.)  
3. Isolated clump of sedge  
(Sphacele media var. sp.)

1. Low open woodland of *Acacia ditrochoides* and *Acacia cotinifera* s/ssp. *occidentalis*

2. Open shrubland of *Gymnoschoenus sphaerocephalus* and *Sida sphaerocarpa*

3. Scattered hummock grasses of *Triodia mobilis*

4.

## ASSOCIATED

### SPECIES:

(tick appropriate box)

Please record up to four of the most widespread vegetation types (with any free standing species) surveyed. Relative Frequencies should follow 2010 Australian Soil and Land Use Survey Field Handbook guidelines - refer to the report for further information and a full list of species names.

## CONDITION OF HABITAT:

Forest  Embankment  Vegetation  Grotto  Scattered  Completely inundated

**APPENDIX M**  
**PLANT SPECIMENS**  
**CHAIN OF CUSTODY FORM**



# **APPENDIX N**

## **LOCATION OF INTRODUCED FLORA**

## APPENDIX N

## LOCATION OF INTRODUCED FLORA

Taxa	Site Number	# Easting	# Northing	% Cover of Species
<i>*Bidens bipinnata</i>	OP09	730181	7423373	+
	OP10	728755	7424913	+
	OP15	731499	7423757	+
	OP29	732602	7424238	1%
	OP30	732279	7424965	+
	OP35	733376	7424307	+
	OP37	731193	7424373	1%
	OP50	734576	7422961	+
	OP59	734898	7421889	+
	OP70	740834	7422922	+
	OP76	742339	7422662	1%
	OP89	741393	7423409	+
	OP97	742938	7423762	+
	OP98	745301	7422012	+
	OP104	746140	7423148	+
	OP105	744179	7424568	+
	OP107	744588	7423898	+
	OP108	746680	7423567	1%
	OP118	738174	7421623	+
	OP139	740960	7421876	+
OP141	741833	7421921	+	
<i>*Malvastrum americanum</i>	OP15	731499	7423757	+
	OP37	731193	7424373	+
	OP59	734898	7421889	+
	OPRCS01	746198	7422661	1%

# Australian Geocentric 1994 (GDA94), Zone 50K

**APPENDIX O**  
**PREVIOUSLY RECORDED CONSERVATION**  
**SIGNIFICANT VERTEBRATE**  
**FAUNA**

APPENDIX O

N1: AMPHIBIAN SPECIES PREVIOUSLY RECORDED IN THE REGION

Key: EPBC = Environment Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DEC = Department of Conservation Priority Code, A = Listed in Naturemap (2010), B = Listed by Birds Australia (2010), C= Mt Whaleback (ecologia 1998a) D= Area C (ecologia 1998b), E= West Angelas Rail (ecologia 1998c), F= West Angelas Pipeline (ecologia 1999), G= Area C (ecologia 2004a), H= Packsaddle (ecologia 2004b), I= Ophthalmia (ecologia 2005a), J= Mudlark (ecologia 2005b), K= Jinayri (ecologia 2006), L= Ophthalmia (ENV 2007b), M= Area C (ENV 2007f), N= Area C West (ENV 2008a), O= Area C (Outback Ecology 2008), P= Southern Flank (ENV 2008c), Q= South Parmelia (Onshore Environmental Consultants 2009), R= Area C West NVCP (ENV 2010a ), S= Jinayri (ENV 2010c), T=Jinayri (ENV 2010d), U= Current Survey

Note: For Definitions of Conservation Codes see Appendix B.

AMPHIBIANS		Conservation Codes																								
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
<b>HYLIDAE</b>																										
<i>Cyclorana maini</i>	Sheep Frog				x		x	x		x					x	x		x	x	x						
<i>Cyclorana platycephala</i>	Water-holding Frog				x															x						
<i>Litoria rubella</i>	Little Red Tree Frog				x		x	x	x	x					x	x	x		x	x	x		x	x		
<b>LIMNODYNASTIDAE</b>																										
<i>Neobatrachus sutor</i>	Shoemaker Frog																			x						
<i>Notaden nicholli</i>	Desert Spadefoot									x																
<i>Platyplectum spenceri</i>	Centralian Burrowing Frog						x		x	x																
<b>MYOBATRACHIDAE</b>																										
<i>Pseudophryne douglasi</i>	Gorge Toadlet								x																	
<i>Uperoleia russelli</i>	Northwest Toadlet								x	x															x	

[X] fauna species recorded from the project area.

[\*] denotes introduced species.



APPENDIX N

N2: REPTILIAN SPECIES PREVIOUSLY RECORDED IN THE REGION

Key: EPBC = Environment Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DEC = Department of Conservation Priority Code, A = Listed in Naturemap (2010), B = Listed by Birds Australia (2010), C= Mt Whaleback (ecolog 1998a) D= Area C (ecologia 1998b), E= West Angelas Rail (ecologia 1998c), F= West Angelas Pipeline (ecologia 1999), G= Area C (ecologia 2004a), H= Packsaddle (ecologia 2004b), I= Ophthalmia (ecologia 2005a), J= Mudlark (ecologia 2005b), K= Jinayri (ecologia 2006), L= Ophthalmia (ENV 2007b), M= Area C (ENV 2007f), N= Area C West (ENV 2008a), O= Area C (Outback Ecology 2008), P= Southern Flank (ENV 2008c), Q= South Parmelia (Onshore Environmental Consultants 2009), R= Area C West NVCP (ENV 2010a ), S= Jinayri (ENV 2010c), T=Jinayri (ENV 2010d), U= Current Survey

Note: For Definitions of Conservation Codes see Appendix B

REPTILES	Scientific Name	Common Name	Conservation Codes																								
			EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
<b>CHELUIDAE</b>																											
	<i>Chelodina steindachneri</i>	Flat-shelled Turtle				x		x																			
<b>AGAMIDAE</b>																											
	<i>Amphibolurus longirostris</i>	Long-nosed Dragon				x		x	x	x			x	x					x	x	x	x	x	x	x	x	x
	<i>Caimanops amphiboluroides</i>	Mulga Dragon				x			x	x									x								
	<i>Ctenophorus caudicinctus</i>	Ring-tailed Rock Dragon				x		x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x
	<i>Ctenophorus isolepis</i>	Military Sand Dragon				x		x	x	x	x	x								x							
	<i>Ctenophorus nuchalis</i>	Central Netted Dragon				x					x																
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon				x		x			x																
	<i>Diporiphora valens</i>										x																
	<i>Diporiphora winneckeii</i>	Blue-lined Dragon									x																
	<i>Pogona minor minor</i>	Bearded Dragon				x		x	x	x	x	x	x								x					x	x
	<i>Pogona minor mitchelli</i>	Bearded Dragon																									
	<i>Tympanocryptis cephalo</i>	Pebble Dragon				x					x																
<b>DIPLODACTYLIDAE</b>																											
	<i>Crenadactylus ocellatus horni</i>	Clawless Gecko				x			x																	x	
	<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko							x																	x	
	<i>Diplodactylus granariensis</i>					x																					
	<i>Diplodactylus pulcher</i>																										x
	<i>Diplodactylus savagei</i>					x			x	x											x				x	x	x
	<i>Lucasium stenodactylum</i>	Pale-snouted Ground Gecko				x			x		x	x									x					x	x
	<i>Lucasium wombeyi</i>	Pilbara Ground Gecko				x			x	x											x				x		x
	<i>Oedura marmorata</i>	Marbled Velvet Gecko				x			x	x		x	x	x							x				x	x	x
	<i>Rhynchoedura ornata</i>	Beaked Gecko							x																		
	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko																								x	
	<i>Strophurus elderi</i>	Jewelled Gecko																									x
	<i>Strophurus jeanae</i>																										
	<i>Strophurus wellingtonae</i>					x			x																		x
<b>CARPHODACTYLIDAE</b>																											
	<i>Nephrurus milii</i>	Barking Gecko																									x
	<i>Nephrurus wheeleri cinctus</i>	Banded Knob-tailed Gecko				x			x																		x
<b>GEKKONIDAE</b>																											
	<i>Gehyra pilbara</i>	Pilbara Dtella				x				x	x																x
	<i>Gehyra punctata</i>	Spotted Rock Dtella				x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Gehyra variegata</i>	Variegated Tree Dtella				x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Heteronotia binoei</i>	Bynoe's Gecko				x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Heteronotia spelea</i>	Pilbara Cave Gecko				x			x																		x
<b>PYGOPODIDAE</b>																											
	<i>Delma borea</i>																										
	<i>Delma butleri</i>	Unbanded Delma																									x
	<i>Delma elegans</i>					x																					x





REPTILES		Conservation Codes																									
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U		
<i>Delma haroldi</i>					x		x				x																
<i>Delma nasuta</i>	Long-nosed Delma				x		x		x	x	x			x	x									x			
<i>Delma pax</i>					x			x	x		x			x				x	x								
<i>Delma tincta</i>					x			x		x					x				x								
<i>Lialis burtonis</i>	Burton's Legless Lizard				x				x	x					x	x	x	x					x				
<i>Pygopus nigriceps</i>	Hooded Scaly-foot				x		x			x										x			x				
<b>SCINCIDAE</b>																											
<i>Carlia munda</i>					x		x	x	x	x	x	x		x	x	x	x	x	x				x	x	x		
<i>Carlia triacantha</i>	Desert Rainbow Skink						x			x																	
<i>Cryptoblepharus buchani</i>	Buchanan's Snake-eyed Skink				x																	x					
<i>Cryptoblepharus ustulatus</i>	Russet Snake-eyed Skink																							x	x		
<i>Cryptoblepharus sp.</i>							x	x	x		x			x	x			x	x	x			x				
<i>Ctenotus duricola</i>					x			x	x	x	x	x															
<i>Ctenotus grandis titan</i>									x	x																	
<i>Ctenotus hanloni</i>								x							x									x			
<i>Ctenotus helenae</i>					x		x			x	x			x	x	x	x			x				x	x		
<i>Ctenotus leonhardii</i>					x			x	x							x											
<i>Ctenotus pantherinus ocellifer</i>	Leopard Ctenotus				x		x	x	x	x	x	x		x	x	x	x	x	x		x			x	x		
<i>Ctenotus piankai</i>								x	x	x															x		
<i>Ctenotus rubicundus</i>					x		x	x	x	x	x	x		x				x						x			
<i>Ctenotus rutilans</i>					x			x		x					x					x	x			x	x	x	
<i>Ctenotus saxatilis</i>	Rock Ctenotus				x		x	x	x	x	x	x			x	x	x	x	x	x		x		x	x	x	
<i>Ctenotus schomburgkii</i>					x			x		x	x							x									
<i>Ctenotus serventyi</i>					x																				x		
<i>Ctenotus uber uber</i>					x					x																	
<i>Cyclodomorphus melanops melanops</i>	Spinifex-slender Bluetongue				x		x	x	x	x		x		x	x		x	x	x					x	x		
<i>Egernia depressa</i>	Pygmy Spiny-tailed Skink				x			x	x	x	x	x			x								x	x			
<i>Egernia formosa</i>	Goldfields Crevice Skink				x			x	x						x		x		x	x		x	x				
<i>Eremiascincus fasciolatus</i>	Narrow-banded Sand-swimmer							x								x			x	x							
<i>Eremiascincus isolepis</i>									x																		
<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer				x		x		x																		
<i>Lerista amicum</i>																											
<i>Lerista flammicauda</i>									x																		
<i>Lerista muelleri</i>					x			x	x	x					x	x		x		x				x			
<i>Lerista neander</i>					x		x			x					x			x						x	x		
<i>Lerista zietzi</i>					x			x		x	x	x			x	x								x			
<i>Menetia greyii</i>	Common Dwarf Skink				x			x		x	x				x			x		x				x	x		
<i>Menetia surda surda</i>					x				x	x																	
<i>Morethia ruficauda exquisita</i>	Fire-tailed Skink				x		x	x	x	x	x	x		x	x			x	x				x	x	x		
<i>Notoscincus ornatus</i>									x																		
<i>Tiliqua multifasciata</i>	Central Bluetongue				x			x	x	x		x			x	x	x	x		x				x	x		



REPTILES		Conservation Codes																								
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
<b>VARANIDAE</b>																										
<i>Varanus acanthurus</i>	Spiny-tailed Monitor				x		x	x	x	x	x	x	x		x	x		x	x			x	x			
<i>Varanus breviceauda</i>	Short-tailed Monitor				x					x						x			x				x	x		
<i>Varanus bushi</i>	Pilbara Mulga Monitor				x													x					x	x		
<i>Varanus aff. caudolineatus</i>																	x									
<i>Varanus caudolineatus</i>	Striped-tailed Monitor				x		x		x	x								x					x	x		
<i>Varanus eremius</i>	Desert Pygmy Monitor								x																	
<i>Varanus giganteus</i>	Perentie						x	x	x	x					x			x	x	x			x	x	x	
<i>Varanus gilleni</i>	Pygmy Mulga Monitor							x	x						x											
<i>Varanus aff. gilleni</i>												x			x											
<i>Varanus gouldii</i>	Gould's Sand Monitor														x					x			x			
<i>Varanus panoptes rubidus</i>	Yellow-spotted Monitor						x	x	x		x	x				x					x		x			
<i>Varanus pilbarensis</i>	Pilbara Rock Monitor						x	x												x						
<i>Varanus tristis tristis</i>	Black-headed Monitor				x		x		x	x	x				x			x	x	x	x			x		
<b>TYPHLOPIDAE</b>																										
<i>Ramphotyphlops ammodytes</i>									x											x				x		
<i>Ramphotyphlops ganei</i>				P1					x									x						x		
<i>Ramphotyphlops grypus</i>	Beaked Blind Snake						x	x	x						x									x		
<i>Ramphotyphlops hamatus</i>									x	x					x	x								x		
<i>Ramphotyphlops pilbarensis</i>	Pilbara Blind Snake				x																					
<i>Ramphotyphlops waitii</i>																										
<b>BOIDAE</b>																										
<i>Antaresia perthensis</i>	Pygmy Python				x		x	x	x	x				x	x		x						x			
<i>Antaresia stimsoni stimsoni</i>	Western Stimson's Python									x		x						x								
<i>Aspidites melanocephalus</i>	Black-headed Python							x	x	x				x	x									x		
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	S1		x														x		x					
<b>ELAPIDAE</b>																										
<i>Acanthophis pyrrhus</i>	Desert Death Adder								x																	
<i>Acanthophis wellsi</i>	Pilbara Death Adder				x		x			x	x						x							x		
<i>Brachyurophis approximans</i>	Northwestern Shovel-nosed Snake				x		x			x					x	x								x		
<i>Demansia psammophis cupreiceps</i>	Yellow-faced Whip-Snake				x					x	x				x			x	x					x		
<i>Demansia rufescens</i>	Rufous Whip-Snake						x					x						x	x					x		
<i>Furina ornata</i>	Moon Snake				x		x										x	x	x					x	x	
<i>Parasuta monachus</i>	Monk Snake				x				x	x																
<i>Pseudechis australis</i>	Mulga Snake				x		x		x						x		x							x	x	
<i>Pseudonaja modesta</i>	Ringed Brown Snake				x				x																	
<i>Pseudonaja nuchalis</i>	Gwardar								x	x					x					x	x			x		
<i>Suta fasciata</i>	Rosen's Snake				x		x	x	x																	
<i>Vermicella snelli</i>	Pilbara Bandy Bandy Snake				x																					

[X] fauna species recorded from the project area.

[\*] denotes introduced species.



APPENDIX N

N3: AVIAN SPECIES PREVIOUSLY RECORDED IN THE REGION

Key: EPBC = Environment Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DEC = Department of Conservation Priority Code, A = Listed in Naturemap (2010), B = Listed by Birds Australia (2010), C= Mt Whaleback (ecologia 1998a) D= Area C (ecologia 1998b), E= West Angelas Rail (ecologia 1998c), F= West Angelas Pipeline (ecologia 1999), G= Area C (ecologia 2004a), H= Packsaddle (ecologia 2004b), I= Ophthalmia (ecologia 2005a), J= Mudlark (ecologia 2005b), K= Jinayri (ecologia 2006), L= Ophthalmia (ENV 2007b), M= Area C (ENV 2007f), N= Area C West (ENV 2008a), O= Area C (Outback Ecology 2008), P= Southern Flank (ENV 2008c), Q= South Parmelia (Onshore Environmental Consultants 2009), R= Area C West NVCP (ENV 2010a ), S= Jinayri (ENV 2010c), T=Jinayri (ENV 2010d), U= Current Survey

**Note:** For Definitions of Conservation Codes see Appendix B.

BIRDS		Conservation Codes																							
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
<b>CASUARIIDAE</b>																									
<i>Dromaius novaehollandiae</i>	Emu							x	x										x						
<b>PHASIANIDAE</b>																									
<i>Coturnix pectoralis</i>	Stubble Quail																		x						
<i>Coturnix ypsilophora</i>	Brown Quail					x										x		x		x					
<b>ANATIDAE</b>																									
<i>Anas gracilis</i>	Grey Teal						x																		
<i>Anas superciliosa</i>	Pacific Black Duck						x		x											x					
<i>Chenonetta jubata</i>	Australian Wood Duck															x									
<i>Cygnus atratus</i>	Black Swan						x		x																
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck						x																		
<i>Tadorna tadornoides</i>	Australian Shelduck						x																		
<b>PODICIPEDIDAE</b>																									
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe						x																		
<b>COLUMBIDAE</b>																									
<i>Geophaps plumifera</i>	Spinifex Pigeon					x	x	x	x			x			x	x	x	x	x	x	x	x	x	x	x
<i>Geopelia cuneata</i>	Diamond Dove					x	x	x	x			x			x	x	x	x	x	x	x	x	x	x	x
<i>Geopelia placida</i>	Peaceful Dove							x	x	x						x	x				x	x			
<i>Phaps chalcoptera</i>	Common Bronzewing					x	x	x	x	x			x		x	x	x	x	x	x				x	x
<i>Ocyphaps lophotes</i>	Crested Pigeon					x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>PODARGIDAE</b>																									
<i>Podargus strigoides</i>	Tawny Frogmouth							x	x		x	x			x	x	x			x			x		
<b>CAPRIMULGIDAE</b>																									
<i>Eurostopodus argus</i>	Spotted Nightjar					x		x	x	x	x	x			x	x	x	x	x		x		x	x	x
<b>AEGOTHELIDAE</b>																									
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar					x	x	x			x	x			x	x	x	x	x	x	x	x			
<b>APODIDAE</b>																									
<i>Apus pacificus</i>	Fork-tailed Swift	Mi													x				x						
<b>PHALACROCORACIDAE</b>																									
<i>Phalacrocorax melanoleucus</i>	Little Pied Cormorant					x	x		x																
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant								x																
<b>PELECANIDAE</b>																									
<i>Pelecanus conspicillatus</i>	Australian Pelican	Ma							x																
<b>ARDEIDAE</b>																									
<i>Ardea modesta</i>	Eastern Great Egret	Mi					x																		
<i>Ardea pacifica</i>	White-necked Heron								x																
<i>Egretta novaehollandiae</i>	White-faced Heron						x	x	x																
<i>Nycticorax caledonicus</i>	Nankeen Night Heron					x			x																
<b>THRESKIORNITHIDAE</b>																									
<i>Threskiornis spinicollis</i>	Straw-necked Ibis								x																



BIRDS	Scientific Name	Common Name	Conservation Codes																							
			EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
<b>ACCIPITRIDAE</b>																										
	<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk						x	x	x							x								x	
	<i>Accipiter fasciatus</i>	Brown Goshawk						x	x	x						x	x		x			x	x	x		
	<i>Aquila audax</i>	Wedge-tailed Eagle						x	x	x	x	x	x			x	x	x	x		x		x			
	<i>Circus assimilis</i>	Spotted Harrier						x	x	x	x					x		x							x	
	<i>Elanus axillaris</i>	Black-shouldered Kite						x		x							x							x		
	<i>Haliastur sphenurus</i>	Whistling Kite						x	x	x			x				x	x	x	x	x	x	x	x	x	x
	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard														x								x		
	<i>Hieraaetus morphnoides</i>	Little Eagle						x		x							x	x		x	x			x		
	<i>Lophoictinia isura</i>	Square-tailed Kite														x										
	<i>Milvus migrans</i>	Black Kite								x									x						x	
<b>FALCONIDAE</b>																										
	<i>Falco berigora</i>	Brown Falcon				x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x
	<i>Falco cenchroides</i>	Nankeen Kestrel						x	x	x	x	x				x	x	x	x		x	x	x			x
	<i>Falco hypoleucos</i>	Grey Falcon			P4					x			x								x		x			
	<i>Falco longipennis</i>	Australian Hobby				x		x	x	x	x					x	x				x					
	<i>Falco peregrinus</i>	Peregrine Falcon			S4			x	x	x																
<b>RALLIDAE</b>																										
	<i>Fulica atra</i>	Eurasian Coot						x																		
	<i>Tribonyx ventralis</i>	Black-tailed Native-hen						x																		
<b>OTIDAE</b>																										
	<i>Ardeotis australis</i>	Australian Bustard			P4	x	x	x	x	x	x					x	x	x		x	x	x	x	x	x	x
<b>BURHINIDAE</b>																										
	<i>Burhinus grallarius</i>	Bush Stone-curlew			P4					x									x							
<b>RECURVIROSTRIDAE</b>																										
	<i>Himantopus himantopus</i>	Black-winged Stilt						x										x								
	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet						x																		
<b>CHARADRIIDAE</b>																										
	<i>Euseyonis melanops</i>	Black-fronted Dotterel						x	x																	
<b>SCOLOPACIDAE</b>																										
	<i>Tringa glareola</i>	Wood Sandpiper						x																		
	<i>Tringa hypoleucos</i>	Common Sandpiper				x																				
	<i>Tringa nebularia</i>	Common Greenshank						x																		
	<i>Tringa stagnatilis</i>	Marsh Sandpiper						x																		
<b>TURNICIDAE</b>																										
	<i>Turnix velox</i>	Little Button-quail						x	x	x	x	x	x	x		x	x	x	x	x	x			x	x	
<b>CACATUIDAE</b>																										
	<i>Cacatua roseicapilla</i>	Galah						x	x	x		x	x	x		x	x	x	x	x	x	x	x	x	x	
	<i>Cacatua sanguinea</i>	Little Corella						x	x	x							x	x	x			x				x
	<i>Nymphicus hollandicus</i>	Cockatiel						x		x						x	x		x				x	x	x	
<b>PSITTACIDAE</b>																										
	<i>Barnardius zonarius</i>	Australian Ringneck						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Melopsittacus undulatus</i>	Budgerigar						x	x	x	x	x	x	x		x	x	x	x			x	x	x		
	<i>Neopsephotus bourkii</i>	Bourke's Parrot							x	x			x				x		x							
	<i>Pezoporus occidentalis</i>	Night Parrot	EN	S1																						
	<i>Psephotus varius</i>	Mulga Parrot				x		x				x				x	x	x	x	x	x			x		
<b>CUCULIDAE</b>																										
	<i>Chrysococcyx osculans</i>	Black-eared Cuckoo						x	x	x					x		x									
	<i>Chrysococcyx basalus</i>	Horsfield's Bronze-Cuckoo						x	x	x	x	x	x		x	x				x	x			x		
	<i>Cuculus pallidus</i>	Pallid Cuckoo						x	x	x	x	x	x			x	x	x		x	x	x		x		x
<b>CENTROPIDAE</b>																										
	<i>Centropus phasianinus</i>	Pheasant Coucal								x																



BIRDS		Conservation Codes																								
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
<b>STRIGIDAE</b>																										
<i>Ninox connivens</i>	Barking Owl								x																	
<i>Ninox novaeseelandiae</i>	Southern Boobook Owl				x	x	x	x	x	x	x					x	x	x								
<b>TYTONIDAE</b>																										
<i>Tyto javanica</i>	Eastern Barn Owl						x		x		x	x			x											
<b>HALCYONIDAE</b>																										
<i>Dacelo leachii</i>	Blue-winged Kookaburra						x		x							x			x		x		x	x		
<i>Todiramphus pyrrhopygia</i>	Red-backed Kingfisher					x	x		x		x	x			x	x	x	x	x	x	x		x	x		
<i>Todiramphus sanctus</i>	Sacred Kingfisher						x		x							x			x				x		x	
<b>MEROPIDAE</b>																										
<i>Merops ornatus</i>	Rainbow Bee-eater	Mi				x	x	x	x						x	x	x	x	x	x		x	x	x	x	
<b>CLIMACTERIDAE</b>																										
<i>Climacteris melanura</i>	Black-tailed Treecreeper							x	x	x		x														
<b>PTILONORHYNCHIDAE</b>																										
<i>Chlamydera guttata</i>	Western Bowerbird					x	x	x	x		x	x			x	x	x	x	x	x	x		x	x		
<b>MALURIDAE</b>																										
<i>Amytornis striatus</i>	Striated Grasswren				x	x	x	x	x	x	x	x			x	x		x	x			x	x	x		
<i>Malurus splendens</i>	Splendid Fairy-wren															x		x		x						
<i>Malurus lamberti</i>	Variegated Fairy-wren				x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	x	x	x	x	
<i>Malurus leucopterus</i>	White-winged Fairy-wren					x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x		
<i>Stipiturus ruficeps</i>	Rufous-crowned Emu-wren						x	x	x		x	x			x			x								
<b>ACANTHIZIDAE</b>																										
<i>Acanthiza apicalis</i>	Inland Thornbill						x	x	x		x				x	x		x	x			x				
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill				x		x	x		x						x		x							x	
<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill						x	x	x		x				x			x		x						
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill				x		x	x	x	x					x	x		x			x		x			
<i>Gerygone fusca</i>	Western Gerygone					x	x	x	x	x	x			x	x	x		x	x	x	x		x	x	x	
<i>Pyrrhalaemus brunneus</i>	Redthroat								x									x								
<i>Smicromis brevirostris</i>	Weebill					x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<b>PARDALOTIDAE</b>																										
<i>Pardalotus rubricatus</i>	Red-browed Pardalote						x	x	x	x					x	x	x	x	x		x		x			
<i>Pardalotus striatus</i>	Striated Pardalote				x	x	x	x	x	x	x	x		x	x	x	x	x	x				x	x		
<b>MELIPHAGIDAE</b>																										
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater					x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Certhionyx niger</i>	Black Honeyeater								x							x									x	
<i>Certhionyx variegatus</i>	Pied Honeyeater						x		x							x	x									
<i>Conopophila whitei</i>	Grey Honeyeater				x				x	x								x								
<i>Epthianura tricolor</i>	Crimson Chat						x		x	x					x	x	x	x		x					x	
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater					x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	
<i>Lichenostomus leucotis</i>	White-eared Honeyeater								x																	
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater					x	x	x	x	x						x		x	x		x	x	x		x	
<i>Lichenostomus virescens</i>	Singing Honeyeater					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Lichmera indistincta</i>	Brown Honeyeater					x	x	x	x		x	x			x	x	x		x	x	x	x	x	x	x	
<i>Manorina flavigula</i>	Yellow-throated Miner					x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<i>Melithreptus gularis</i>	Black-chinned Honeyeater				x			x	x		x	x				x	x	x								
<i>Phylidonyris albifrons</i>	White-fronted Honeyeater						x		x	x						x									x	
<b>POMATOSTOMIDAE</b>																										
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler						x	x	x	x	x				x	x		x	x	x	x	x	x		x	
<i>Pomatostomus superciliosus</i>	White-browed Babbler						x	x	x					x	x	x		x								
<b>CINCLOSOMATIDAE</b>																										
<i>Cinclosoma castaneothorax</i>	Chestnut-breasted Quail-thrush									x																
<i>Psophodes occidentalis</i>	Chiming Wedgebill								x																	



BIRDS		Conservation Codes																							
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
<b>NEOSITTIDAE</b>																									
<i>Daphoenositta chrysoptera</i>	Varied Sittella							x	x	x							x	x							
<b>CAMPEPHAGIDAE</b>																									
<i>Coracina maxima</i>	Ground Cuckoo-shrike							x	x	x						x	x	x	x				x	x	
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x
<i>Lalage tricolor</i>	White-winged Triller					x	x	x	x			x	x	x		x	x	x	x	x	x		x		
<b>PACHYCEPHALIDAE</b>																									
<i>Colluricincla harmonica</i>	Grey Shrike-thrush					x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Oreocina gutturalis pallescens</i>	Crested Bellbird				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Pachycephala rufiventris</i>	Rufous Whistler					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>ARTAMIDAE</b>																									
<i>Artamus personatus</i>	Masked Woodswallow						x	x								x	x	x							x
<i>Artamus cinereus</i>	Black-faced Woodswallow					x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Artamus minor</i>	Little Woodswallow					x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Cracticus torquatus</i>	Grey Butcherbird					x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Cracticus nigrogularis</i>	Pied Butcherbird					x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Gymnorhina tibicen</i>	Australian Magpie					x	x	x	x			x	x			x	x	x	x	x	x		x	x	x
<b>DICRURIDAE</b>																									
<i>Grallina cyanoleuca</i>	Magpie-Lark						x	x	x			x	x			x	x	x	x	x	x	x	x	x	x
<i>Rhipidura fuliginosa</i>	Grey Fantail						x		x					x		x	x	x					x	x	
<i>Rhipidura leucophrys</i>	Willie Wagtail						x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x
<b>CORVIDAE</b>																									
<i>Corvus bennetti</i>	Little Crow							x		x						x			x						x
<i>Corvus orru</i>	Torresian Crow				x	x	x	x	x			x	x			x	x	x	x	x	x	x	x	x	x
<b>PETROICIDAE</b>																									
<i>Melanodryas cucullata</i>	Hooded Robin					x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x
<i>Petroica goodenovii</i>	Red-capped Robin					x	x	x	x							x	x	x							
<b>ALAUIDAE</b>																									
<i>Mirafra javanica</i>	Singing Bushlark								x							x	x				x				
<b>SYLVIIDAE</b>																									
<i>Acrocephalus australis</i>	Australian Reed Warbler						x		x																
<i>Cincloramphus mathewsi</i>	Rufous Songlark						x	x	x								x	x			x	x		x	x
<i>Cincloramphus cruralis</i>	Brown Songlark							x	x																
<i>Eremiornis carteri</i>	Spinifex Bird				x		x	x	x	x	x					x	x	x			x	x		x	
<b>HIRUNDINIDAE</b>																									
<i>Hirundo ariel</i>	Fairy Martin						x		x								x		x						
<i>Hirundo nigricans</i>	Tree Martin						x	x	x								x	x					x		
<i>Hirundo neoxena</i>	Welcome Swallow																x				x				x
<b>DICAEIDAE</b>																									
<i>Dicaeum hirundinaceum</i>	Mistletoebird					x	x	x	x			x	x				x	x					x		
<b>PASSERIDAE</b>																									
<i>Emblema pictum</i>	Painted Finch					x	x	x	x			x	x			x	x	x	x	x	x	x	x	x	x
<i>Neochmia ruficauda clarescens</i>	Star Finch			P4		x			x			x	x												
<i>Taeniopygia guttata</i>	Zebra Finch						x	x	x			x	x	x			x	x	x	x	x	x	x	x	x
<b>MOTACILLIDAE</b>																									
<i>Anthus novaeseelandiae</i>	Richard's Pipit						x		x							x	x	x	x	x		x			

[X] fauna species recorded from the project area.

[\*] denotes introduced species.



APPENDIX N

N4: MAMMALIAN SPECIES PREVIOUSLY RECORDED IN THE REGION

Key: EPBC = Environment Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DEC = Department of Conservation Priority Code, A = Listed in Naturemap (2010), B = Listed by Birds Australia (2010), C= Mt Whaleback (ecologia 1998a) D= Area C (ecologia 1998b), E= West Angelas Rail (ecologia 1998c), F= West Angelas Pipeline (ecologia 1999), G= Area C (ecologia 2004a), H= Packsaddle (ecologia 2004b), I= Ophthalmia (ecologia 2005a), J= Mudlark (ecologia 2005b), K= Jinayri (ecologia 2006), L= Ophthalmia (ENV 2007b), M= Area C (ENV 2007f), N= Area C West (ENV 2008a), O= Area C (Outback Ecology 2008), P= Southern Flank (ENV 2008c), Q= South Parmelia (Onshore Environmental Consultants 2009), R= Area C West NVCP (ENV 2010a ), S= Jinayri (ENV 2010c), T=Jinayri (ENV 2010d), U= Current Survey

Note: For Definitions of Conservation Codes see Appendix B.

MAMMALS	Scientific Name	Common Name	Conservation Codes																								
			EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
<b>TACHYGLOSSIDAE</b>																											
	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna						x	x		x																
<b>DASYURIDAE</b>																											
	<i>Dasykaluta rosomondae</i>	Little Red Kaluta				x		x	x	x	x	x					x	x	x	x					x	x	
	<i>Dasyurus hallucatus</i>	Northern Quoll	EN	S1						x																	
	<i>Ningauai timealeyi</i>	Pilbara Ningauai				x		x	x	x	x	x				x		x		x					x		
	<i>Planigale ingrami</i>	Long-tailed planigale								x									x								
	<i>Planigale maculata</i>	Common Planigale						x	x	x									x								
	<i>Planigale sp.</i>	Planigale													x				x						x	x	
	<i>Psuedantechinus woolleyae</i>	Woolley's Pseudantechinus				x		x																			
	<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart						x																			
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart				x		x	x	x	x	x							x								
	<i>Sminthopsis ooldea</i>	Ooldea Dunnart				x		x	x	x	x																
	<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart																							x		
<b>MACROPODIDAE</b>																											
	<i>Macropus robustus erubescens</i>	Euro						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Macropus rufus</i>	Red Kangaroo						x		x	x					x	x		x	x	x	x	x	x		x	
	<i>Petrogale rothschildi</i>	Rothschild's Rock-wallaby						x	x	x							x		x	x	x	x					
	<i>Petrogale sp.</i>	Rock-wallaby													x												
<b>EMBALLONURIDAE</b>																											
	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat									x	x	x			x	x				x	x		x	x	x	
	<i>Taphozous georgianus</i>	Common Sheath-tail Bat				x					x	x	x			x	x	x	x		x	x		x	x	x	
	<i>Taphozous hilli</i>	Hill's Sheathtail-bat				x		x	x	x	x								x					x		x	
<b>MEGADERMATIDAE</b>																											
	<i>Macroderma gigas</i>	Ghost Bat									x	x				x									x		
<b>HIPPOSIDERIDAE</b>																											
	<i>Rhinonictes aurantia</i>	Pilbara Leaf-nosed Bat	VU	S1		x																			x		
<b>VESPERTILIONIDAE</b>																											
	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				x			x	x	x	x	x			x		x	x		x	x		x	x	x	
	<i>Nyctophilus bifax daedalus</i>	Pallid Long-eared Bat				x					x					x											
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat								x	x		x			x		x	x					x			
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat						x	x			x	x														
	<i>Scotorepens greyii</i>	Little Broad-nosed Bat				x		x	x		x					x	x	x	x		x	x		x	x	x	
	<i>Vespadelus finlaysoni</i>	Finlayson's Cave Bat				x		x	x	x	x	x	x			x	x	x	x		x	x		x	x	x	
<b>MOLOSSIDAE</b>																											
	<i>Chaerephon jobensis</i>	Northern Freetail-bat				x					x	x				x	x	x	x		x			x	x		
	<i>Mormopterus beccarii</i>	Beccari's Freetail-bat				x		x		x	x		x			x	x	x			x			x	x	x	
	<i>Tadarida australis</i>	White-striped Freetail-bat				x			x	x	x										x			x	x	x	
<b>MURIDAE</b>																											
	<i>Leggadina lakedownensis</i>	Short-tailed Mouse									x																
	* <i>Mus musculus</i>	House Mouse				x		x		x	x					x	x		x						x		



MAMMALS		Conservation Codes																							
Scientific Name	Common Name	EPBC	WC	DEC	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
<i>Notomys alexis</i>	Spinifex Hopping-mouse						x																x		
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse			P4	x		x	x	x	x	x	x		x	x		x		x	x	x	x	x	x	x
<i>Pseudomys desertor</i>	Desert Mouse				x		x		x	x					x		x	x							
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse				x		x	x	x	x	x				x				x				x		
<i>Pseudomys nanus</i>	Western Chestnut Mouse																	x							
<i>Pseudomys</i> sp.															x										
<i>Zygomys argurus</i>	Common Rock-rat				x		x	x	x	x	x					x	x	x	x	x			x		
<b>LEPORIDAE</b>																									
<i>*Oryctolagus cuniculus</i>	European Rabbit								x							x									x
<b>CANIDAE</b>																									
<i>Canis lupus dingo</i>	Dingo						x	x	x		x	x			x			x	x	x	x	x	x	x	x
<i>*Vulpes vulpes</i>	Fox																		x		x				
<b>FELIDAE</b>																									
<i>*Felis catus</i>	Feral Cat							x	x		x				x				x	x	x	x			
<b>EQUIDAE</b>																									
<i>*Equus asinus</i>	Donkey						x		x																
<i>*Equus caballus</i>	Horse						x		x													x			x
<b>CAMELIDAE</b>																									
<i>*Camelus dromedarius</i>	Camel																						x	x	x
<b>BOVIDAE</b>																									
<i>*Bos taurus</i>	Cow						x	x	x						x				x	x		x	x	x	x
<i>*Capra hircus</i>	Goat						x																		

[X] fauna species recorded from the project area.

[\*] denotes introduced species.

References:

Birds Australia (2010). *Birddata Atlas*. Available from: <[www.birddata.com.au/](http://www.birddata.com.au/)> [April 2010].





# **APPENDIX P**

## **LOCATION OF CONSERVATION SIGNIFICANT FAUNA**

**APPENDIX P**

**LOCATION OF CONSERVATION SIGNIFICANT FAUNA**

Species Name	Common Name	Listing	#Eastings	#Northings	Species/Habitat Photos
<i>Ardeotis australis</i>	Australian Bustard	Priority – P4	735218	7423345	
<i>Merops ornatus</i>	Rainbow Bee-eater	EPBC – Mi	677361	7451681	

#Australian Geocentric 1994 (GDA94) Zone 50K

# APPENDIX Q

## PEBBLE MOUND LOCATIONS

**APPENDIX Q**

**PEBBLE MOUND LOCATIONS**



**Q1: Pebble Mound Locations for Ophthalmia (2010 survey)**

Pebble Mound #	Easting	Northing	Activity
PM 1	729047	7424104	Recently Inactive
PM 2	738954	7421735	Active
PM 3	731503	7425805	Extinct
PM 4	733225	7425435	Extinct
PM 5	733262	7422387	Extinct
PM 6	733697	7422787	Extinct
PM 7	735724	7423685	Extinct
PM 8	729271	7425578	Recently Inactive
PM 9	745588	7423706	Recently Inactive
PM 10	736836	7424066	Extinct
PM 11	736784	7424034	Recently Inactive
PM 12	736779	7424103	Extinct

#Australian Geocentric 1994 (GDA94) Zone 50K

**Q2: Active Pebble Mound Photos for Area C West NVCP (2010 survey)**

Pebble Mound #	Photo
PM 1	

Pebble Mound #	Photo
PM 2	
PM 8	
PM 11	