

LEVEL 2 FLORA AND VEGETATION SURVEY

OF

LAMB CREEK PROJECT AREA

For

PROCESS MINERALS INTERNATIONAL

JUNE 2012



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EXECUTIVE SUMMARY

Process Minerals International (PMI) proposes to develop a small iron ore mine with associated haul roads and infrastructure at Lamb Creek. The Lamb Creek project area is located approximately 130 kilometres (km) north-west of Newman in the East Pilbara Region of Western Australia, and is accessed via the Great Northern Highway.

A Level 2 flora and vegetation survey was completed in the approximately 20 km² survey area, comprising a desktop search and a single-phase comprehensive field survey from 27 March to 1 April 2012 by a team of three botanists. 46 survey quadrats were established.

A total of 230 species, from 110 genera and 42 families, were recorded during the survey of the Lamb Creek area, from 414 specimens collected. Of those, 209 were collected within survey quadrats; the rest were collected opportunistically.

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, and no species listed as Threatened pursuant to the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999 were recorded in the project area.

Three species of Priority Flora listed by DEC were recorded during the survey, comprising one Priority 1 species (*Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662)) and two Priority 2 species (*Aristida calycina* var. *calycina* and *Aristida lazaridis*). These taxa were found only in the far south-west of the survey area in the vicinity of the intersection of the proposed access/haul roads with the Great Northern Highway.

Five species of introduced flora were recorded in the survey area: *Bidens bipinnata* (Bipinnate Beggartick), *Cenchrus ciliaris* (Buffel Grass), *Chloris virgata* (Feathertop Rhodes Grass), *Malvastrum americanum* (Spiked Malvastrum), and *Portulaca oleracea* (Purslane).

None of these taxa were listed as Declared Plants by the WA Department of Agriculture and Food pursuant to section 37 of the *Agricultural and Related Resources Protection Act 1976* (Western Australia). None of these taxa were listed as Weeds of National Significance by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC 2012).

Vegetation mapping was conducted by statistical analysis using the software PATN combined with field observations of vegetation boundaries and visual classification of aerial photography. The most widespread vegetation type was *Eucalyptus gamophylla* woodland over hummock grassland which was estimated to cover approximately 46% of the survey area.

Six main vegetation communities were recognised and mapped following field observations and statistical analysis of the field data.

No Threatened or Priority Ecological Communities listed by the DEC were recorded.



1. **INTRODUCTION**

1.1. **PROJECT BACKGROUND**

Process Minerals International (PMI) proposes to develop a small iron ore mine with associated haul roads and infrastructure at Lamb Creek. The Lamb Creek project area is located approximately 130 kilometres (km) north of Newman in the East Pilbara Region of Western Australia, and is accessed via the Great Northern Highway.

An overview of the tenements in which the project is located is presented in Table 1. The project is currently in the design phase; hence alternative locations for elements such as the accommodation facility appear in several tenements.

Tenement	Project Elements (as per April 2012)	Size		
M47/1468	Mining area	1201 ha		
L47/635	Bore field, accommodation facility, pipeline, power line, taking water.	82 ha		
L47/636	Bore field, accommodation facility, pipeline, power line, taking water.	64 ha		
L47/637	Bore field, pipeline, power line, road, taking water.	149 ha		
L47/638	Bore field, pipeline, power line, road, taking water.	30 ha		
L47/639	Bore field, pipeline, power line, road, taking water.	276 ha		
L47/640	Bore field, pipeline, power line, road, taking water.	156 ha		
L47/641	Bore field, pipeline, power line, road, truck parking bay, taking water.	42 ha		
E47/1238	Exploration licence including M47/1468	44 blocks		
E47/1239	Pending: Currently held by Rio Tinto	64 blocks		
Source: Tengraph and Mineral Titles Online (Department of Mines and Petroleum 2012)				

 Table 1
 Tenements in which the project area is located

1.2. SCOPE AND OBJECTIVES OF THE SURVEY

As part of the environmental approvals process, Rapallo conducted a single phase Level 2 flora and vegetation survey of the proposed Lamb Creek iron ore mine, two alternative haul road routes (120 metre buffer either side) and three alternative accommodation village sites. For the purpose of this report this area will hereafter be referred to as the "survey area" (Figure 1). The area surveyed comprised approximately 20 km², although the actual project footprint will be smaller.

The aims of the survey were to:

- characterise the flora and vegetation within the survey area;
- identify and map the vegetation communities;
- identify and map all Threatened and Priority Flora Species.

This information will be used to assist with environmental assessment of the project and, and to guide environmental management plans.

The flora and vegetation survey was designed according to Environmental Protection Authority (EPA) *Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (2004). This guidance indicates that a project in the Pilbara region with an impact greater than 50 ha requires a Level 2 flora and vegetation survey.





1.3. LEGISLATION AND SURVEY GUIDANCE

1.3.1. **COMMONWEALTH LEGISLATION AND CONSERVATION CATEGORIES**

Native flora and ecological communities are protected at a federal level under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, defined as matters of national environmental significance. Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance need to be referred to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities (SEWPaC) for assessment and approval.

The EPBC Act protects Australia's native species and ecological communities by providing for identification and listing of threatened species and ecological communities. The conservation status of native species and communities is assessed by the Commonwealth Threatened Species Scientific Committee criteria outlined in the *EPBC Act 1999* and the *Environment Protection and Biodiversity Conservation Regulations 2000*.

The following categories of threatened flora are recognised: Extinct (EX), Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

Ecological communities are unique and naturally occurring groups of plants and animals. Their presence can be determined by factors such as soil type, position in the landscape, climate and water availability. The following categories of Threatened Ecological Communities are recognised: Critically Endangered (CR), Endangered (EN), and Vulnerable (VU).

1.3.2. Western Australian Legislation and Conservation Categories

At a state level, native flora and vegetation communities are protected under the *Wildlife Conservation Act 1950*, the *Western Australian Environmental Protection Act 1986* and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*

Threatened and Priority Flora

All native vegetation in Western Australia is protected under the *Environmental Protection Act 1986* and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Under the Act and Regulations, clearing of native vegetation is prohibited unless a clearing permit is granted or the clearing is for a purpose defined under Regulation 5 as an exempt activity.

Flora that are threatened, rare or otherwise in need of protection, are protected under the *Wildlife Conservation Act 1950*. Threatened (Declared Rare) Flora species are listed under Schedule 1. Extinct flora are listed under Schedule 2. The species listed under Schedules 1 and 2 are published in the WA Government Gazette *Wildlife Conservation (Rare Flora) Notices*, the most recent dated 17 February 2012 (Western Australian Government 2012).

Threatened (Declared Rare) Flora listed on Schedule 1 are further ranked by the Department of Environment and Conservation (DEC) according to their level of threat using IUCN Red List criteria. The following categories of threatened flora are recognised: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

The DEC also recognises Priority Flora, comprising taxa that have not yet been adequately surveyed to be listed as Threatened, but for which the DEC believes there is cause for concern. Priority flora listings can be found on the FloraBase website (Western Australian Herbarium 2012). Priority flora species recognised as having conservation significance and are given consideration when developments are



proposed within their distributions and known habitats. There are 5 levels of Priority flora: Priorities 1, 2 or 3 (not yet adequately surveyed), Priority 4 (rare, near threatened or in need of monitoring), and Priority 5 (conservation dependent) (Appendix 1).

Environmentally Sensitive Areas

Environmentally sensitive areas (ESAs) are protected under the *Environmental Protection (Clearing of Native Vegetation) Regulation 2004* and are listed for their environmental values at state or national levels. ESAs in Western Australia are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005.* (Western Australian Government 2005). These include:

- Declared World Heritage property sites
- Bush Forever sites
- Defined wetlands and riparian vegetation within 50 metres of the wetland
- Area of vegetation within 50 metres of Declared Rare Flora
- Areas covered by Threatened Ecological Communities

Exemptions offered for clearing under Regulation 5 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* do not apply within an ESA.

Threatened and Priority Ecological Communities

An Ecological Community is defined by the DEC as a naturally occurring biological assemblage that occurs in a particular type of habitat. In Western Australia there is currently no legislation covering the conservation of Threatened Ecological Communities (TEC). However, TEC are indirectly protected under the *Environmental Protection Act 1986* and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* through protection of individual flora species. Under the Regulations TEC are defined as Environmentally Sensitive Areas, and therefore the exemptions from requiring a clearing permit do not apply in a TEC.

The DEC (2010) defines a Threatened Ecological Community as one that fits into one of the following categories: Presumed Totally Destroyed (PD), Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

Ecological communities that do not meet TEC criteria are listed on the Priority Ecological Community (PEC) list. Priorities 1, 2 and 3 are communities that are possibly threatened but not yet adequately surveyed. Priority 4 comprised communities that are in need of monitoring, and Priority 5 are communities that are conservation dependent (DEC 2010, 2012b).

1.3.3. NATIONAL AND WESTERN AUSTRALIAN WEED STRATEGIES

Invasive weeds are a serious threat to Australia's natural environment and can have major economic and social impacts, causing damage to natural landscapes, agricultural lands, waterways and coastal areas. A weed can either be an exotic (introduced) species, or a native species that colonises and ecosystem where it does not naturally occur (Commonwealth of Australia 2012a).

Federal Weeds of National Interest

The Federal government departments responsible for weed issues are SEWPaC and the Department of Agriculture, Fisheries and Forestry (DAFF). Weeds of national interest are published on one of several lists, with the nature of weeds and the national actions required determining on which list a species appears. The Federal lists are:



- Weeds of National Significance (WONS) Published in the *Australian Weeds Strategy* (Commonwealth of Australia 2007) these 20 weeds are considered to be Australia's most significant environmental weeds;
- The National Environmental Alert List 28 plant species in the early stages of establishment, which have the potential to become a significant threat to biodiversity if they are not managed;
- Sleeper weeds Exotic plants that currently have established small populations but which have the potential to spread widely and affect agricultural or natural environments;
- Species targeted for national eradication under the Natural Resource Management Ministerial Council's National Cost-sharing Eradication Programme;
- Species targeted for biological control.

Western Australian Declared and Environmental Weeds

In addition to the weeds of national interest, state and territory governments have their own lists of noxious weeds. In Western Australia, the principal legislation pertaining to weeds is the *Agriculture and Related Resources Protection Act 1976* (ARRPA).

The Department of Agriculture and Food has published a list of *Declared Plants* under the ARRPA (DAFWA 2011). There are five categories of declared plants defined under the ARRPA with the following management actions and aims associated with them:

- Priority 1 Prohibiting movement of plants and/or their seeds through the prevention of trade, sale or movement of plants into the State or that area of the State;
- Priority 2 Eradication of plants from the State or that area of the State;
- Priority 3 Controlling infestations by reducing area and/or density of infestation from the State or that area of the State;
- Priority 4 Preventing infestations spreading beyond existing boundaries of infestation; and
- Priority 5 Infestations must be controlled on public land or land under the control of a local government.

The DEC (previously Department of Conservation and Land Management, CALM) has published the *Environmental Weed Strategy for Western* Australia (CALM 1999). The strategy itself is still considered relevant but the *List of Environmental Weed Species of Actual and Potential Significance in WA* (Appendix 3 to the Strategy) is now out-dated (DEC 2012a).

More recently the DEC published a series of lists of Environmental Weeds in each of the DEC regions, based on workshops held between 2008 and 2010. These lists do not assign a single "priority" classification to each weed, but instead outline the relative threat in each region based on a number of criteria including their distribution, ecological impact and rate of dispersal. The DEC points out that at present these lists should be used as a guide only (DEC 2012a).

At the time of writing, FloraBase (WA Herbarium 2012) lists 1,358 taxa that may be considered weed species of actual or potential significance in Western Australia, of which 107 in the Pilbara region. These figures are subject to change as a result of ongoing changes to taxon nomenclature.

1.3.4. Environmental Protection Authority Guidance

The Western Australian Environment Protection Authority (EPA) has produced a series of position statements and guidance statements to aid in assessing the environmental impacts of developments in Western Australia.



The following statements outline the minimum expectations of the EPA in regards to consideration of terrestrial flora and vegetation communities in an environmental impact assessment.

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

Combined, these guidance and position statements provide general recommendations for consideration for planning environmental surveys, including the level of survey required, design and intensity factors, survey limitations and reporting criteria.



2. **EXISTING ENVIRONMENT**

2.1. **BIOGEOGRAPHY**

The survey area lies within the Hamersley (PIL3) subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) region (SEWPaC 2012a), covering the southern section of the Pilbara Craton (Kendrick 2002). The Hamersley subregion is a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges of basalt, shale and dolerite (Kendrick 2002).

2.1.1. LAND SYSTEMS

The survey area traverses five different land systems within the Hamersley subregion, as described by Van Vreeswyk *et al.* (2004). These are:

- **Boolgeeda** Stony lower slopes and stony plains and narrow drainage floors and channels, supporting hard and soft spinifex grasslands and mulga shrublands., level stony plains and narrow sub-parallel drainage floors, relief up to 20 m. Often occurs below hill systems such as Newman and Rocklea.
- **McKay** Hills, ridges, plateaux remnants and minor breakaways of sedimentary and meta sedimentary rocks supporting hard spinifex grasslands; relief up to 100 m.
- Newman Rugged high mountains, ridges and plateaux with near vertical escarpments of jaspilite, chert and shale, supporting hard spinifex grasslands; relief up to 400 m.
- **Platform** Stony upper plains, dissected slopes and drainage floors, supporting hard spinifex grasslands. Erosional surfaces formed by partial dissection of the old tertiary surface. The gently inclined upper plains have extensive marginal dissection zones with gently inclined to steep slopes. Floors incised up to 30m with steep stable marginal slopes becoming wider downslope.
- Wannamunna Hardpan plains and internal drainage tracts supporting mulga shrubland and woodlands, and occasionally eucalypt woodlands). Depositional surfaces, level hardpan wash plains subject to overland sheet flow. Broad internal drainage flats receiving run-on from adjacent hardpan surfaces; rare channelled tracts but moistly no organised through drainage; relief up to 5m.

The approximate area of each land system within the Pilbara region and within the survey area is presented in Table 2.

Land System	Total area in Pilbara (km²)	Area within survey area (km ²)	Percentage of total within survey area
Boolgeeda	7,748	11.58	0.15 %
МсКау	4,202	0.44	0.01 %
Newman	14,580	2.77	0.02 %
Platform	1,570	1.98	0.12 %
Wannamunna	577	0.27	0.04 %

Table 2Land systems of the survey area

2.1.2. **GEOLOGY**

The survey area is located in the south-west corner of the Roy Hill 1:250,000 Geological Survey Sheet (SF50-12: Thorne & Tyler 1997). The geology of the survey area is generally defined by the assemblage of prehnite, pumpellyite, epidote, actinolite. Basement rocks comprise the early Proterozoic Brockman



Iron Formation and Weeli Wolli Formation. The Brockman Iron Formation consists of banded iron formation (BIF) and shale, while the Weeli Wolli formation consists of BIF separated by shale and siltstone bands, with younger dolerite sills that intersect the sedimentary sequence.

Regionally, the fresh basement rocks are typically overlain by weathered basement rocks which occur as lateritic and basal gravel and/or conglomerate deposits. These weathered deposits underlie early Tertiary Channel Iron Deposits (CID), which are the dominant economic-grade iron deposits in the region. The CID is typically overlain by younger alluvial and colluvial gravels and sediments (Thorne & Tyler 1997).

The survey geology comprises the following geological units (Thorne & Tyler 1997).

- Brockman Iron Formation (PLHB): banded iron-formation, chert, and pelite;
- Quaternary Alluvium (Qa): unconsolidated silt, sand, and gravel; in drainage channels and on adjacent floodplains;
- Quaternary Alluvium and Colluvium (Qw): red-brown sandy and clayey soil; on low slopes and sheetwash areas; and
- Cainozoic Colluvium (Czc): partly consolidated quartz and rock fragments in silt and sand matricx; old valley-fill deposits.

2.1.3. Soils and Landforms

The survey area is located within the Fortescue botanical district of the Pilbara region (Beard 1990). This region is mountainous, with soils ranging from shallow, stony sandy loams along slopes, to cracking clays, stripped hardpans and calcareous loams along active waterways (Beard 1990).

The survey area is typical of the eastern Pilbara with rocky hills, small gorges, mostly seasonal watercourses and gravelly loam valleys. It is typified by hard red alkaline soils on plains, pediments and alluvial areas, while shallow, skeletal soils are common on ranges that rise to 1,250 m (Beard 1990). The southern part of eastern Pilbara region is characterised by earthy loams underlain by red-brown hardpan (Beard 1975; 1990).

The survey area has two distinct soil and landform assemblages. The majority of the potential haul road alignment and the edges of the mine tenement are characterised as landform unit Fa13. The central part of the mine tenement and small portion of the potential haul road alignment is characterised as landform unit Fb3. These are defined as follows (CSIRO Australia 2006–):

- Fa13 Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations with some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. Associated are (Dr2.33, Dr2.32) soils on the limited areas of dissected pediments, while (Um5.52) and (Uf6.71) soils occur on the valley plains; and
- **Fb3** High-level valley plains set in extensive areas of unit Fa13. There are extensive areas of pisolitic limonite deposits: principal soils are deep earthy loams (Um5.52) along with small areas of (Gn2.12) soils.

2.1.4. HYDROLOGY

Regional stream flow in the Pilbara is ephemeral, related to intense rainfall from with cyclonic activity or localised thunderstorms. Stream flow decays rapidly once rainfall has ceased. The drainage system upstream of the Fortescue Marsh has negligible base flow with stream flow and water table recharge following rainfall events (Van Vreeswyk *et al.* 2004).



The proposed mining area (tenement M47/1468) contains four minor non-perennial (type 2) watercourses. The southern proposed haul route option (L47/638, L47/639, L47/641) and two prospective accommodation areas (L47/635, L47/636) are crossed by eight minor non-perennial watercourses. Seven non-perennial watercourses cross the northern proposed haul road option (L47/637, L47/640) and the northern prospective accommodation area (E47/1329). No major or perennial drainage lines occur within or directly adjacent to the survey area (Commonwealth of Australia 2012b).

2.2. **REGIONAL VEGETATION**

The survey area is located in the Fortescue botanical district of the Pilbara region (Beard 1990), which forms part of the Eremaean Province. The Pilbara region receives a slightly higher than average rainfall than most of the Eremaean Province, due to the prevalence of cyclones off the coast, but this is not enough to modify the essentially desert appearance of the plant cover (Beard 1990).

The Fortescue district consists predominantly of tree and shrub steppe communities with *Eucalyptus* trees, *Acacia* shrubs and spinifex grasses including *Triodia pungens* and *T. wiseana* (Beard 1975). Mulga (*Acacia aneura*) occurs in valleys and short-grass plains may be present on alluvial soils (Beard 1990).

Vegetation of the Hamersley (PIL3) IBRA subregion is generally low Mulga woodland over bunch grasses on fine textured soils in the valleys with snappy gums (*Eucalyptus leucophloia*) over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2002). The mountain tops and gorges of the Hamersley subregion provide refugia for humidophile and/or fire intolerant flora, and support a diversity of range-restricted species (Kendrick 2002).

Beard (1975) mapped the area of the flora survey as Hamersley 82: hummock-grass (*Triodia wiseana*) steppe with irregularly scattered *Eucalyptus brevifolia* trees; and Hamersley 18: Low woodland of *Acacia aneura*.

Beard (1970) vegetation type	Total area in WA (km ²)*	Area within survey area (km ²)	Percentage of total within survey area*
Hamersley 82	246,591.1	8.67	0.0035 %
Hamersley 18	29,209.1	12.01	0.0411 %

 Table 3
 Beard (1975) vegetation areas of the Lamb Creek survey area

*Note: areas of vegetation types are taken from Shepherd *et al.* (2001). This document is now over ten years old, and significant vegetation clearing has taken place in the Pilbara region in the time since its publication. Area values given should be considered optimistic estimates rather than actual areas.

2.3. **CLIMATE**

The Pilbara region of Western Australia experiences an arid tropical climate with most rain falling during the hot summers between January and March (Beard 1990). Rainfall occurs in sporadic heavy rainfall events that occur during or immediately following cyclones. Cyclones develop off the north-west coast and often cross the coastline between Karratha and Port Hedland and move inland over the Fortescue Valley system towards Newman.

The closest Bureau of Meteorology (BOM) weather station to the survey area is at Newman Airport (station number 007176), located 130 km south-east of the survey area. This weather station has been recording rainfall data since 1971 and temperature data since 1996.



Data recorded at Newman Airport (Figure 2) shows a mean annual rainfall of 313.2 millimetres (mm). Mean monthly rainfall is highest in February at 77.3 mm, and lowest in September at 4.5 mm. The hottest month is January with a mean maximum temperature of 39.2°C and a mean minimum temperature of 23.9°C. The annual wind records from 9am and 3pm show a dominant easterly throughout the day, with the strongest winds recorded in the morning of up to 30 km/hour (BOM 2012).

Evaporation rates are not recorded at the Newman Airport Weather Station. However, evaporation in the Central Pilbara Region is estimated to be between 2000 mm and 3500 mm per annum, which is approximately ten times greater than annual rainfall (Gardiner 2003). This disparity maintains a typically arid landscape, with the exception of areas located in proximity to river systems and shallow groundwater resources.

The flora and vegetation survey of the survey area took place from 27 March to 1 April 2012. Rainfall in the three months preceding the survey was higher than average for the region, with a total of 307.8 mm recorded for the months of January to March 2012 combined, of which 239.4 was recorded in January 2012. Temperatures during the survey were generally warm during the day, ranging from 33.8 °C to 36.8 °C during the day, and mild at night, ranging from 22.1 °C to 25.2 °C (BOM 2012).



Figure 2 Newman Airport Weather Station – Average temperatures and rainfall

2.4. **RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS**

Environmentally Sensitive Areas

The survey area is not situated within an ESA as defined under the Environmental Protection (Environmentally Sensitive Areas) Notice 2005 (Western Australian Government 2005).

There are no ESAs within 5 km of the survey area. The nearest Nationally Important Wetland is the Fortescue Marshes, located 52 km north of the survey area (SEWPaC 2012c).



Conservation Reserves

The survey area does not occur within a conservation reserve. The nearest nature reserves to the survey area (within a 100 km radius) are listed below (SEWPaC 2012c).

- Karijini National Park (DEC) 26 km west of the survey area;
- Mungaroona Range National Park (DEC) 52 km north of the survey area.

Threatened and Priority Ecological Communities

The project area is not located within a known TEC or PEC. The nearest known PEC is the Coolibah-Lignum Flats vegetation community, with the edge of the buffer zone located 6 km south of the survey area (DEC Threatened and Priority Communities database, search reference 35-0212EC).

The Coolibah-Lignum Flats vegetation complex is described as: Woodland or forest of *Eucalyptus victrix* (coolibah) over thicket of *Muehlenbeckia florulenta* (lignum) on red clays in run-on zones. Associated species include *Eriachne benthamii*, *Themeda triandra*, *Aristida latifolia*, *Eulalia aurea* and *Acacia aneura* (DEC 2012b). A series of sub-types have been identified:

- Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on clay plains (Coondewanna Flats and Wanna Munna Flats) Priority 3
- Coolibah woodlands over lignum (*Muehlenbeckia florulenta*) over swamp wandiree; Lake Robinson is the only known occurrence Priority 1
- Coolibah woodland over lignum and silky browntop (*Eulalia aurea*); two occurrences known on Mt Bruce Flats Priority 3



3. **METHODS**

A Level 2 flora and vegetation survey was completed in the survey area, comprising a desktop search and a single-phase comprehensive field survey. Throughout this report taxonomy and taxonomic nomenclature follows the Western Australian Herbarium FloraBase website (Western Australian Herbarium 2012).

3.1. **DESKTOP SEARCH**

A desktop search was completed in preparation for the field survey, in order to provide a local context for the survey results, and to identify flora species and vegetation communities of conservation significance in the vicinity of the project area. The desktop search included a database search and a review of publically accessible literature and relevant survey reports within 100 km of the project area.

The database search included a combined search of the DEC Threatened (Declared Rare) and Priority Flora database, the WA Herbarium Specimen database, and the DEC Threatened and Priority Flora List (DEC reference number 38-0212FL); the NatureMap online search tool (DEC 2012); and the Protected Matters online search tool (SEWPaC 2012c) (Table 4).

Following completion of the field survey and taxonomic identifications, a follow-up database search was requested from the DEC (search reference number 04-0512FL) to obtain full details of all populations of the Priority species recorded during the survey in order to calculate the potential conservation impact of the project on these species (Table 4).

Database Name	Latitude	Longitude	Search Area
DEC Threatened and Priority Flora database WA Herbarium database DEC Threatened and Priority Flora Species List	Search area based on shapefile of project area		40 km buffer around shapefile boundary
NatureMap	22°50'18" S	118°50'17" E	40 km buffer around coordinates
SEWPaC Protected Matters	22°53'28" S 22°50'28" S 22°47'44" S 22°50'20" S	118°48'09" E 118°47'16" E 118°58'05" E 118°51'54" E	10 km buffer around coordinates
DEC Species Specific search	Search carried out by species, not location		

Table 4Database Searches

Published literature and reports reviewed for the desktop search are listed in Table 5.

Table 5Reports Reviewed for Desktop Study

Report Title	Distance from project area					
Astron (2010a). West Pilbara Iron Ore Project Reconciliation of Vegetation Descriptions and Associated Vegetation Mapping. Unpublished report for API Management Pty Ltd.	25–30 km north-west					
Astron (2010b). <i>Area C to Yandi flora and vegetation survey</i> . Unpublished report for BHP Billiton.	14 km north to 15 km east					
Astron (2012) Iron Valley Project Flora and Vegetation Survey. Unpublished report for URS Australia Pty Ltd on behalf of Iron Ore Holdings Ltd.	48 km east north-east					



Report Title	Distance from project area
Biota (2004). <i>Vegetation and flora survey of the proposed FMG stage A rail corridor</i> . Unpublished report for Fortescue Metals Group.	40 km east to 100 km north (only sites <100 km included in review)
Biota (2010). Vegetation and flora surveys of the Oxbow and Junction South West deposits near Yandicoogina. Unpublished report for Rio Tinto Pty Ltd.	35 km east
ENV (2008). Rapid Growth Project 5: Jimblebar Junction to Yandi Junction Railway Reserve, Flora and Vegetation Assessment Report. Unpublished report for BHP Billiton.	15 km north to 150 km south-east (only sites <100 km included)
Mattiske (2005). <i>Flora and vegetation on the Cloudbreak and White King leases</i> . Unpublished report prepared for Fortescue Metals Group Ltd.	85 km north-east
Mattiske (2008a). Flora and Vegetation Survey of Exploration Tenement E47/1237 Phil's Creek Project area. Unpublished report for URS Australia.	35 km east
Mattiske (2008b). <i>Flora and vegetation of the Hope Downs 4 mine infrastructure corridor</i> . Unpublished for Pilbara Iron.	30 km south-east
Rapallo (2012). Level 2 flora and vegetation survey of Phil's Creek Haul Road. Unpublished report for Process Minerals International.	30–45 km north-east

3.2. FIELD SURVEY

A single-phase Level 2 flora and vegetation survey was completed in the survey area from 27 March to 1 April 2012. The timing of the survey in autumn, following a period of significant rainfall or the region (section 2.3) is considered an appropriate time for conducting flora surveys in the Pilbara bioregion (EPA 2004). This is the time when the majority of plant species are flowering, fruiting and have foliage that allows identification, and provides the best opportunities for recording ephemeral or cryptic species.

The survey was completed by a team of three suitably qualified and experienced botanists. Geographic information system (GIS) data and aerial photography were used to demark the project area and to identify potential areas of interest. Survey areas were accessed by helicopter and were surveyed on foot.

The survey activities included:

- Flora quadrat surveys;
- Vegetation mapping;
- Opportunistic flora collections.

All specimens collected in the field were identified at the Western Australian Herbarium by Rapallo botanists, assisted by expert taxonomists where required (Table 7). Taxonomic identifications were completed using specialist texts, floral identification keys and comparisons with reference specimens held at the Western Australian Herbarium.

Specimens of conservation significant species, species found outside their normal range and other species of interest were lodged with the Western Australian Herbarium.

3.2.1. FLORA QUADRATS

Quadrat surveys involved a detailed and comprehensive search of a 50 by 50 m quadrat. Within each quadrat all flora taxa were recorded and specimens were collected of each species or subspecies when they were first encountered during the survey. Hence, specimens were collected for all taxa recorded in



the first quadrat, while specimen collection from subsequent quadrats only comprised taxa that had not been collected from previous quadrats unless considered possible to be different taxa. All species were thus collected at least once.

The following data were recorded for each quadrat:

- Location coordinates and elevation (on Garmin GPS units (MGA50, GDA94) and datasheet);
- Botanist name and Date The name of the botanist involved in sampling the quadrat and the survey date;
- Species all vascular plant species present, including introduced species were recorded;
- Percentage Foliar Cover the percentage cover was estimated for each species within the quadrat;
- Height the maximum height of each taxon was recorded;
- Soil and geology description including soil colour and type, and rock percentage cover, type, and size;
- Terrain and topography description;
- Vegetation condition assessed in accordance to the Vegetation Condition Classification of Keighery 1994 – Appendix II);
- Vegetation Description vegetation was described according to Aplin's (1979) modification of the vegetation classification system of Specht (1970) and the National Vegetation Invenotry System, Level 5 (Department of Environment and Heritage 2003 (Appendix V);
- Digital photographs of the quadrats were taken from different directions;

A total 46 of flora quadrats were established during the survey, with sites located in each of the five land systems within the project area. The number of sites (quadrats) per land system are listed in (Table 6) below and mapped in **Error! Reference source not found.**

Land system	Number of sites	Site names
Boolgeeda	14	LCF10, LCF11, LCF12, LCF14, LCF15, LCF21, LCF24, LCF26, LCF27, LCF35, LCF39, LCF40, LCF41, LCF42, LCF52
McKay	18	LCF05, LCF06, LCF16, LCF17, LCF18, LCF19, LCF20, LCF22, LCF23, LCF25, LCF28, LCF29, LCF30, LCF31, LCF32, LCF36, LCF37, LCF38
Newman	3	LCF01, LCF02, LCF43, LCF46
Platform	5	LCF03, LCF04, LCF07, LCF08, LCF09, LCF45
Wannamunna	2	LCF33, LCF34, LCF51

 Table 6
 Survey site established in each land system in the Lamb Creek survey area

3.2.2. VEGETATION MAPPING

The boundaries of vegetation communities were established by ground-truthing the imagery of aerial photographs. Transition boundaries of vegetation communities were recorded manually on an aerial photograph of the project area, and waypointed with a GPS. Vegetation classification was carried out using the statistical analysis program PATN (Belbin 1989). Digital maps of vegetation communities were produced by Rapallo in a geographic information system (GIS) program using the results of the PATN analysis as a guide, with field-collected data serving to clarify and interpret the PATN results where required.



3.2.3. **OPPORTUNISTIC FLORA COLLECTIONS**

Opportunistic flora collections were made while traversing the project area between survey quadrats and during vegetation mapping. Opportunistic collections provide a valuable complement to the other collections and survey data, as they may be used to improve the botanical knowledge of the area.

Specimens were collected of all species that had not been recorded during the quadrat surveys. For each opportunistic collection, the following data were recorded: GPS location, density or numbers at location, growth form, and height of the plant. Digital photographs were taken where necessary for identification purposes and whenever a species was thought to be a conservation significant taxon.

3.3. **STATISTICAL ANALYSIS**

3.3.1. **PATN A**NALYSES

Survey sites were grouped into clusters of similar vegetation communities, based on the presence and density of the taxa recorded, by using the software program PATN v3.12 (Belbin 1989).

Analysis was done using Bray and Curtis association, a flexible UPGMA classification with a beta of - 0.1, and seven final groups. Ordination was done using the default settings.

Kruskal-Wallis statistics were used to identify the taxa that were producing the most statistical noise; these taxa were then removed from the analysis. This process was repeated until the ordination stress values produced by the analysis were considered sufficiently low (ideally below 0.15). The Kruskal-Wallis values were then used to determine which species contributed most strongly to each vegetation group in order to describe the vegetation types.

3.3.2. **E**STIMATE**S**

The software program EstimateS (Windows Version 8.20) (Colwell 2006) was used to estimate survey completeness by generating species accumulation curves, and by calculating predicted total species richness. Analyses were conducted on presence-absence data from flora survey quadrats (46 quadrats, 214 taxa), using the default settings, with the following exceptions:

- Accumulations (runs) were randomised 10,000 times without replacement;
- Upper abundance limit for rare or infrequent species was set to 5;

The species accumulation curve was plotted as the number of species recorded (y-axis) against the number of flora quadrats surveyed (x-axis). Predicted species richness was calculated by taking the average of the estimators Jacknife 1, Jacknife 2 and Bootstrap.

Predicted species richness was compared with observed species richness, comprising all species recorded from quadrats (214 taxa), and with observed species richness comprising total number of species recorded during the survey, including opportunistic records (223 taxa).



3.4. SURVEY PERSONNEL AND LICENSING

The following people were involved with the survey and the preparation of this report:

Staff	Role	Flora License
Linda Dalgliesh	Botanist for Rapallo Environmental	SL009472
Joshua Gilovitz	Botanist for Rapallo Environmental	SL009605
Marieke Weerheim	Environmental Scientist for Rapallo Environmental	SL009964
Dr Eleanor Bennett	Taxonomist for Bennett Environmental Consulting	n/a
Sharnya Thompson	Consultant Taxonomist	n/a

Table 7Personnel involved in the survey

Collection of specimens for the flora and vegetation survey was licensed under the Western Australian *Wildlife Conservation Act 1950* "Licence to take Flora for Scientific or Other Prescribed Purposes". As part of the license requirements, a copy of this report will be forwarded to the DEC.

3.5. SURVEY LIMITATIONS

The potential limitations of the survey, as outlined in EPA *Guidance Statement No. 51* (2004) are discussed in Table 8.

Potential Limitation	Discussion
Sources of information and availability of contextual information (i.e. pre-existing background vs. new material)	Government database records were obtained for the area, although some of the species recorded in the field were not present in those data. Multiple similar flora surveys exist for surrounding areas, including one completed by Rapallo.
Scope (i.e. what life forms, etc., were sampled).	All vascular plant species were recorded when found in survey quadrats or encountered while traversing the area on foot.
Proportion of flora collected and identified (based on sampling, timing and intensity).	Statistical analysis shows that 86% of the predicted species richness was recorded during the survey, with a near-asymptotic species accumulation curve (Section 4.2.1). Specimen quality was high: of the 414 specimens collected, 96.4% could be identified to species or infraspecific level.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed).	The survey area is considered well sampled, with the exception of two areas within the main mining area that were poorly sampled. These areas are considered unlikely to contain different vegetation or species than those that were recorded throughout the rest of the survey area based on helicopter flyovers and satellite photographs.
Mapping reliability.	High quality satellite photographs of the area were available, and various other mapping resources (soils, geology, vegetation) were also available.
Timing, weather, season, cycle.	The survey was carried out in late March - early April, which is considered to be an appropriate time for the area. Rainfall was above average in the three months preceding the survey, and floristic diversity was high.

 Table 8
 Potential limitations and discussion of their relevance to the survey



Potential Limitation	Discussion
Disturbances (fire, flood, accidental human intervention etc.).	The survey area occurs in an active pastoral lease, and some sites were noted as disturbed by cattle, as well as infrastructure associated with the pastoral lease and recent mineral exploration. Evidence of old (>5 years) fire was noted in some areas, however the majority of the survey area was relatively undisturbed and long unburnt.
Intensity (in retrospect, was the intensity adequate).	Statistical analysis demonstrates that survey intensity was adequate floristically; however more intensive sampling of some minor vegetation types may have resulted in more precise mapping.
Resources.	The field staff had adequate resources for the survey including reports of previous botanical surveys of the area, lists and information outlining all Declared Rare and Priority Flora, maps, GPS information supplied by the client, handheld GPS units, cameras, and the necessary equipment for botanical collection.
Experience levels (e.g. degree of expertise in plant identification to taxon level).	Herbarium identification was carried out by a combination of Rapallo staff and experienced external contractors (Eleanor Bennet and Sharnya Thomson). All specimen identifications were verified by a second botanist/taxonomist following initial identification.



4. **RESULTS**

4.1. DESKTOP SEARCH RESULTS

The combined review of databases, survey reports and published literature yielded a total of 68 taxa of conservation significant flora taxa previously recorded from within 100 km of the survey area. The majority of these (57 taxa) were recorded in the various databases, while an additional 11 taxa were recorded in previous surveys within 100 km of the survey area (Table 9).

Conservation Status	Databases (within 40 km)	Survey reports (within 100 km)	Total taxa								
Threatened (Declared Rare) Flora	2	1	2								
Priority 1	11	2	11								
Priority 2	14	3	15								
Priority 3	26	12	34								
Priority 4	4	5	6								
Totals	57	23	68								

Table 9Number of conservation significant taxa recorded in databases and previous surveys

Two species of Threatened (Declared Rare) flora were recorded within 40 km of the survey area. These were *Lepidium catapycnon* (Hamersley Lepidium) and *Thryptomene wittweri* (Mountain Thryptomene); both taxa are listed under the EPBC Act as Vulnerable, and listed under the Wildlife Conservation Act as Schedule 1 – rare or likely to become extinct.

In addition, 66 taxa listed by the DEC as Priority Flora were recorded in the desktop search; these comprised 11 Priority 1 species, 15 Priority 2 species, 34 Priority 3 species, and six Priority 4 species.

The complete list of conservation significant flora recorded in the desktop search is presented in Table 10. Please note that the DEC Threatened (Declared Rare) and Priority Flora database (TPFL) lists populations, and the WA Herbarium database (WAHerb) lists individual specimens. All other databases and reports listed in Table 10 represent presence or absence of a particular taxon within the search area.



Table 10 Desktop search results – Conservation significant flora taxa recorded within 100 km of the survey area

	Databases ¹⁾						Survey reports ²⁾							
Taxon name and conservation status	TPFL	TPList	WAHerb	NatureMap	SEWPaC	A1	B1	B2	E	M1	M2	M3	R	
Threatened (Declared Rare) Flora		•							<u> </u>					
Lepidium catapycnon	17		1	1	1			1				1		
Thryptomene wittweri	2		4	1										
Priority 1		•							<u> </u>					
<i>Brachyscome</i> sp. Wanna Munna Flats (S. van Leeuwen 4662)	1		2	1										
Brunonia sp. Long hairs (D.E. Symon 2440)			1	1										
Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)	1		1	1										
Eremophila sp. West Angelas (S. van Leeuwen 4068)			1	1										
Eremophila spongiocarpa	1	1	1	1			1			1				
<i>Grevillea</i> sp. Turee (J. Bull & G. Hopkinson ONS JJ 01.01)				1										
Josephina sp. Marandoo (M.E. Trudgen 1554)	2	1	1	1			1							
Rhodanthe ascendens	1	1	1											
Tetratheca fordiana	1	1	1											
Teucrium pilbaranum		1	1	1										
<i>Vittadinia</i> sp. Coondewanna Flats (S. van Leeuwen 4684)			6	1										
Priority 2														
Adiantum capillus-veneris		1												
Aristida calycina var. calycina		1												
Aristida lazaridis		1												
Cladium procerum		1												
Eremophila forrestii subsp. Pingandy (M.E. Trudgen 2662)	1	1	3	1										
Euphorbia clementii	1			1										
Euphorbia sp. Mt Bruce flats (S. van Leeuwen 3861)		1												



Taxon name and conservation status	Databases ¹⁾						Survey reports ²⁾							
Taxon name and conservation status		TPList	WAHerb	NatureMap	SEWPaC	A1	B1	B2	E	M1	M2	M3	R	
Indigofera ixocarpa		1												
Isotropis parviflora		1												
Oxalis sp. Pilbara (M.E. Trudgen 12725)		1	3	1										
Paspalidium retiglume							1							
Pilbara trudgenii	3		2	1										
Spartothamnella puberula	1	1	3	1										
Stylidium weeliwolli	1		4									1		
Vigna sp. Central (M.E. Trudgen 1626)		1				1								
Priority 3														
Abutilon trudgenii							1							
Acacia daweana	2	1	1											
Acacia effusa	4	1	2	1										
Acacia glaucocaesia						1								
Acacia subtiliformis	2	1	2	1										
Ampelopteris prolifera		1												
Atriplex flabelliformis		1												
Dampiera anonyma		1												
Dampiera metallorum	9	1	17	1										
Eremophila forrestii subsp. viridis												1		
Eremophila magnifica subsp. velutina	1		1											
Eriachne sp. Dampier Peninsula (K.F. Kenneally 5946)		1												
Euphorbia inappendiculata											1			
Euphorbia stevenii		1												
Fimbristylis sieberiana	1		1											
Glycine falcata	1	1	1	1										
Goodenia lyrata	3		2	1										



	Databases ¹⁾					Survey reports ²⁾								
Taxon name and conservation status		TPList	WAHerb	NatureMap	SEWPaC	A1	B 1	B2	Е	M1	M2	M3	R	
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	4	1	3	1			1							
Indigofera gilesii subsp. gilesii	3	1	6	1										
Indigofera sp. Bungaroo Creek (S. van Leeuwen 4301)						1								
Iotasperma sessilifolium		1	1	1										
Nicotiana umbratica		1												
<i>Oldenlandia</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)			2	1										
Olearia mucronata	2	1	1	1										
Owenia acidula						1								
Phyllanthus aridus		1												
Rhagodia sp. Hamersley (M Trudgen 17794)	3		3	1								1	1	
Rostellularia adscendens var. latifolia			3	1					1	1				
Sida sp. Barlee Range (S. van Leeuwen 1642)			3	1										
Tecticornia medusa			1	1										
Terminalia supranitifolia						1								
Themeda sp. Hamersley Station (M.E. Trudgen 11431)		1	4	1			1			1				
Triodia sp. Mt Ella (M.E. Trudgen 12739)			7	1										
<i>Triodia</i> sp. Robe River (M.E. Trudgen et al. MET 12367)						1								
Priority 4														
Acacia bromilowiana	4	1	10	1		1								
Bulbostylis burbidgeae							1		1					
Eremophila magnifica subsp. magnifica			4	1										
Eremophila youngii subsp. lepidota										1		1		
Goodenia nuda	3		3	1		1		1	1					
Rhynchosia bungarensis			2	1		1								



Footnotes with Table 9

1) Databases: TPFL = DEC Threatened (Declared Rare) and Priority Flora database TPList = DEC Threatened and Priority Flora List WAHerb = Western Australian Herbarium Database NatureMap = DEC Naturemap online search tool (DEC 2007–) SEWPaC = Protected Matters online search tool (SEWPaC 2012c)

2) Survey reports: A1 = Astron (2010a) A2 = Astron (2010b) B1 = Biota (2004) B2 = Biota (2010) E = ENV (2008) M1 = Mattiske (2005) M2 = Mattiske (2008a) M3 = Mattiske (2008b) R = Rapallo (2012)



4.2. FIELD SURVEY RESULTS

4.2.1. FLORA TAXA RECORDED IN THE SURVEY

Summary Statistics

A total of 414 specimens were collected during the survey. Following taxonomic identification, these were found to represent 230 species or infraspecies. Of all specimens collected, 15 could not be identified to species level due to absence of suitable fruiting or flowering material. Specimens that could not be positively identified to species or subspecies level were only counted in the final species list if they were thought likely to represent a taxon that was not otherwise recorded. The total species list is presented in Appendix III.

The average number of flora taxa per survey quadrat was 25.83. This number is relatively high for surveys in the Pilbara area and was influenced by the presence of many annual / ephemeral species in at the sites, due to the survey being completed within three months following significant rainfall events, and also due to the presence of some extremely species-rich sites that increased the overall average.

Taxonomic level	Number of taxa	Most common taxa (number of species)
Family	42	Poaceae (41), Fabaceae (41), Malvaceae (26)
Genus	110	Acacia (23), Ptilotus (11), Senna (9)
Species	230	-

 Table 11
 Summary statistics of taxa recorded in the survey area

The average Keighery (1994) vegetation condition was 2.51 (excellent - very good). The most common disturbances observed were grazing by cattle, vehicle tracks and mineral exploration impact, and weeds.

Survey Completeness

The species richness estimators calculated with EstimateS indicate that 81% of the predicted number of flora taxa were recorded during the survey at Lamb Creek. This is reflected in the species accumulation curve, which approached an asymptote as the number of sites increased (Figure 3).

The predicted species richness was 264.9 based on the average of the estimators Jacknife 1, Jacknife 2 and Bootstrap, with observed species richness of 214 representing the number of species recorded from flora quadrats. Opportunistic flora collections made while walking between sites included another 16 species that had not been recorded in the quadrats. Hence, the total number of 230 flora species represents 86.8% of predicted species richness.

These figures suggest that increased survey effort, i.e. more flora quadrats, and/or more transects, may have produced a higher number of species recorded from the survey area. However, the fact that the accumulation curve reached a near-asymptote indicates that a large increase in the number of survey quadrats would have been required to reach a figure about 90% survey completeness. Furthermore, the fact that 93% of all taxa recorded during the survey were collected from the quadrat sites indicates that the sites were well placed within the survey area to sample all available vegetation types.





Figure 3 Species accumulation curve for the Lamb Creek L2 flora survey

4.2.2. CONSERVATION SIGNIFICANT TAXA

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, and no species listed as Threatened pursuant to the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999 were recorded in the survey area.

Three species of Priority Flora listed by DEC were recorded during the survey, comprising one Priority 1 species (*Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662)) and two Priority 2 species (*Aristida calycina* var. *calycina* and *Aristida lazaridis*). The locations of conservation significant flora taxa recorded in the survey area are presented in Figure 4; the coordinates of all these records are listed in Appendix IV.

Brachyscome sp. Wanna Munna Flats (S. van Leeuwen 4662) - Priority 1

This species is a small herb in the Asteraceae (daisy) family, with pink flowers and sharply divided leaves.

Brachyscome sp. Wanna Munna Flats (S. van Leeuwen 4662) was collected at LCF33, LCF51, and LCF34. Single plants or small numbers present at all sites. This species was recorded as occurring in small but consistent numbers throughout the area between these sites, at the far-western extent of the proposed haul road.

The species is known from ten collections in the WA Herbarium from an approximately 330 km wide south east - north west band, with the current survey area situated roughly in the centre. The nearest record is from 2006 and was 20km to the west of the collection made within the survey area. *Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662) is represented by two records in the TPFL database, which are both probably derived from WAHERB specimen records as they share dates and coordinates with WAHERB records.

A specimen of this species will be submitted to the WA Herbarium collection.



Aristida calycina var. calycina - Priority 2

Aristida calycina var. *calycina* is described as a loosely tufted perennial grass, 0.3-1.3 m high, with smooth lemma groove. It occurs on red earths, sands, and alluvial soils (Western Australian Herbarium 2012). Widespread throughout NSW and is present in several other Australian states (The Royal Botanic Gardens and Domain Trust 2012).

This species was collected at site LCF31, where only a single plant was recorded. The specimen did not match the description of the species exactly, however was very close to collection S. van Leeuwen PBS0466, and will be assumed to be *A. calycina* var. *calycina* for the purposes of this report.

This taxon is known in Western Australia from a single specimen at the Western Australian Herbarium (Sheet 04867599), and is not recorded in DEC's TPFL database. The existing WA Herbarium record was collected in 1996 and has coordinates placing it approximately 65 km away from our collection.

The specimen collected will be submitted to the Western Australian Herbarium collection.

Aristida lazaridis - Priority 2

Aristida lazaridis is a tufted perennial grass, 0.4-1.5 m high, with green and purple flowers in April, occurring on sand or loam (Western Australian Herbarium 2012).

This species was record at site LCF31, where it was relatively abundant, with a density rated at 5-25%.

Aristida lazaridis is known from only two specimens at the WA Herbarium. One was collected in 2008, approximately 55 km to the east south east of our record, and the second was collected the same distance to the north west in 1996. The species is not recorded in DEC's TPFL database.

A specimen of Aristida lazaridis will be submitted to the WA Herbarium collection.





4.2.3. **W**EEDS

Five species of introduced flora (weeds) were recorded in the survey area: *Bidens bipinnata* (Bipinnate Beggartick), *Cenchrus ciliaris* (Buffel Grass), *Chloris virgata* (Feathertop Rhodes Grass), *Malvastrum americanum* (Spiked Malvastrum), and *Portulaca oleracea* (Purslane).

None of these taxa were listed as Declared Plants by the WA Department of Agriculture and Food pursuant to section 37 of the *Agricultural and Related Resources Protection Act 1976* (Western Australia). None of these taxa were listed as Weeds of National Significance by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC 2012).

Five weed species were recorded at nine locations in the Lamb Creek survey area (Figure 5, Figure 6). Weed species were more abundant at locations where evidence of cattle was noted. The site that contained the most weed species was LCF31, where four weed species were found.

Bidens bipinnata (Bipinnate Beggartick)

Bidens bipinnata is an erect annual herb, from 0.1-0.9 m high, with yellow flowers from March to September. It occurs on alluvium, clay, loam over sandstone, and limestone, along rivers and creeks, in coastal areas, and on rocky hillsides. It is widespread throughout the Pilbara and also occurs in other north-western WA regions (Western Australian Herbarium 2012).

Bidens bipinnata was the most commonly recorded weed species, found at nine sites in the survey area: LCF12, LCF15, LCF18, LCF20, LCF23, LCF31, LCF34, LCF37, LCF46.

Cenchrus ciliaris (Buffel Grass)

Cenchrus ciliaris is a tufted perennial grass to 1.5m in height, with purple seed-heads from February to October (Western Australian Herbarium 2012). The seeds of this weed are spread by wind, water, stock and machinery (Thorp and Wilson 1998-2012). Buffel Grass has become a major environmental weed of northern Australia, displacing native species, and carrying fire into areas where fire was not normally part of the ecosystem (Thorp and Wilson 1998-2012, Hussey *et al* 2007).

This species was observed at a single site, LCF23, in the current project.

Chloris virgata (Feathertop Rhodes Grass)

Chloris virgata is an annua grass, usually from 0.23-0.45 m high, with green-purple flowers from April to May or in September. It usually occurs on sand dunes. It occurs in many areas of WA and is common in the Pilbara region (Western Australian Herbarium 2012).

Chloris virgata was observed at a single site, LCF31, in the current project.

Malvastrum americanum (Spiked Malvastrum)

Malvastrum americanum is an erect perennial herb or shrub, from 0.5-1.3 m high. It has yellow-orange flowers in April to July. It occurs on orange, red, or yellow sands, gritty alluvial sand, black or brown clay, alluvial cracking clays, limestone, and calcrete, on stony ridges and hillsides, floodplains, and along drainage lines. It is widespread and common within the Pilbara and other north-western regions of WA (Western Australian Herbarium 2012).

Malvastrum americanum was recorded at site LCF31 in the survey area.



Portulaca oleracea (Purslane)

Portulaca oleracea is a succulent, prostrate to decumbent annual herb to 0.2 m high. It has yellow flowers from April to May, and occurs on clay loam and sand, often in disturbed sites. It has been recorded extensively in the Pilbara, and also occurs in many other regions of WA (WA Herbarium 2012).

In the survey area, Portulaca oleracea was recorded at sites LCF31 and LCF34.







4.2.4. VEGETATION COMMUNITIES IN THE SURVEY AREA

Six vegetation communities were identified in the survey area. PATN analysis results were largely consistent with field mapping of vegetation communities, although they were partially manually adjusted to produce the final integrated results.

None of the vegetation communities in the survey area represented a TEC or PEC. The Coolibah-Lignum Flats vegetation complex PEC includes some species recorded in the survey, including 'mulga' (*Acacia aptaneura*, previously considered part of the *A. aneura* complex), however mulga was not found in association with *Eucalyptus victrix*, or with the species assemblage described in the PEC. *Eucalyptus victrix* was thought to be recorded at a single site, however due to lack of fruit was not able to be identified positively, and at that site it was not associated with any of the other species described in the Coolibah-Lignum Flats vegetation complex PEC.

PATN Dendrogram

Following analysis and evaluation, 110 species were selected for inclusion in the PATN analysis. This produced a dendrogram of seven vegetation types, with a stress value of 0.1686 (Figure 7). The quadrats assigned to one group, which consisted of two sites (LF12 and LCF32), were manually reassigned to other groups based on field observations, to produce six final groups.




Figure 7 PATN dendrogram of analysis of survey quadrats



Vegetation Mapping

Based on field observations and PATN analysis, six main vegetation communities were recorded. The vegetation type occurring most widely across the survey area was *Eucalyptus gamophylla* woodland over hummock grassland (Table 1).

Vegetation community	Total area (km ²) within survey area	Percentage of survey area
1. <i>Eucalyptus gamophylla</i> woodland over hummock grassland	9.57	46 %
2. <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> woodland over mixed shrubs over <i>Triodia wiseana</i> grassland	5.25	25 %
3. Acacia shrubland over hummock grassland	1.30	6 %
4. Acacia tumida var. pilbarensis scrub in creeklines	0.64	3 %
5. Wannamunna Mulga grove	0.66	3 %
6. Acacia aptaneura over hummock grassland	3.26	16 %
Totals	20.68	100 %

 Table 1
 Total and percentage area of each vegetation type recorded in the Lamb Creek survey area

The vegetation communities of the survey area are mapped in Figures 8, 9, 10, 11, 12 and 13 and described in detail in Table 13 below.



Table 13Description of vegetation communities

Vegetation Community	Plate	Land System	Substrate	Description	Quadrats
1. Eucalyptus gamophylla woodland over hummock grassland	1	Boolgeeda, McKay, Newman, Platform	Clay loams with BIF and ironstone pebbles and gravel on open plains and gentle rises	Eucalyptus gamophylla low open woodland over Acacia elachantha or Acacia hilliana, Senna glutinosa subsp. pruinosa open shrubland over Triodia brizoides, Triodia wiseana hummock grassland.	LCF01, LCF02, LCF04, LCF06, LCF08, LCF09, LCF22, LCF38, LCF40, LCF42, LCF52
2. Eucalyptus leucophloia subsp. leucophloia woodland over mixed shrubs over Triodia wiseana grassland	2	Boolgeeda, Platform	Clays and clay loams with BIF and ironstone pebbles, cobbles, and sheetrock in gorges and rocky creeklines and on hillsides and breakaways	Eucalyptus leucophloia subsp. leucophloia, Eucalyptus gamophylla low open woodland over mixed species (typically Gossypium robinsonii, Acacia hilliana, Grevillea wickhamii, Keraudrenia nephrosperma) scattered shrubs over Triodia wiseana hummock grassland.	LCF07, LCF10, LCF11, LCF12, LCF14, LCF16, LCF21, LCF23, LCF24, LCF25, LCF26, LCF27, LCF28, LCF29, LCF30, LCF30, LCF35, LCF39, LCF45



Vegetation Community	Plate	Land System	Substrate	Description	Quadrats
3. <i>Acacia</i> shrubland over hummock grassland	3	Boolgeeda, Newman	Sandy clay with ironstone gravel and pebbles on gentle slopes at bases of hills	Acacia bivenosa or Acacia adsurgens open shrubland over Triodia sp. Shovelanna Hill (S. van Leeuwen 3835), Triodia wiseana hummock grassland.	LCF36, LCF41, LCF43
4. Acacia tumida var. pilbarensis scrub in creeklines	4	Boolgeeda, Platform	Clay loam and sandy clay with laterite pebbles in drainage lines	Acacia tumida var. pilbarensis tall open scrub over Themeda triandra tussock grassland and Triodia wiseana open hummock grassland.	LCF03, LCF15
5. Wannamunna Mulga grove	5	Boolgeeda, Wannamunna	Sandy clay and clay on flat plains	Acacia aptaneura low woodland over Themeda triandra, Cymbopogon ambiguus, Chrysopogon fallax open tussock grassland.	LCF31, LCF32, LCF34, LCF51
6. <i>Acacia aptaneura</i> over hummock grassland	6	Boolgeeda, Wannamunna	Broad open drainage system through stony plains with clay soils	Acacia aptaneura and/or Corymbia deserticola low woodland over Acacia elechantha and mixed Eremophila species over Triodia wiseana very open hummock grassland	LCF17, LCF18, LCF19, LCF20, LCF33, LCF37



Type 1: Eucalyptus gamophylla woodland over hummock grassland

A widespread vegetation type within the survey area, and especially within the main mining tenement and western haul road areas of the project, occurring on open plains and gentle rises.

This vegetation type had a mean Keighery health rating of 2.667 (excellent-very good) with the main disturbance causes being grazing (cattle), vehicle tracks, and erosion.

No weed species or Priority flora species were observed in this vegetation type.



Plate 1 *Eucalyptus gamophylla* woodland over hummock grassland vegetation type (site LCF09)



Type 2: *Eucalyptus leucophloia* subsp. *leucophloia* woodland over *Triodia wiseana* hummock grassland

The most widespread vegetation type within the survey area occurring on rocky ridges, hillsides, rocky minor drainage lines, and gorges.

This vegetation type had a mean Keighery health rating of 2 (excellent) with the main disturbance causes being grazing (cattle) and weeds.

The weed species *Bidens bipinnata* and *Cenchrus ciliaris* were observed at three sites in this vegetation type. No Priority flora species were observed in this vegetation type.



Plate 2 Eucalyptus leucophloia subsp. leucophloia woodland vegetation type (site LCF24)



Type 3: Acacia shrubland over hummock grassland

This is a minor vegetation type within the survey area. It occurs at three sites along the western haul road section of the survey area and on rocky gentle slopes at the base of hills.

This vegetation type had a mean Keighery health rating of 1.667 (pristine - excellent) with the main disturbance causes being grazing (cattle) and vehicle tracks.

No weed species or priority flora species were observed in this vegetation type.



Plate 3 Acacia shrubland over hummock grassland vegetation type (site LCF36)



Type 4: Acacia shrubland over hummock grassland

A minor vegetation type within the survey area, occurring at only two sites in medium-sized creek lines.

This vegetation type had a mean Keighery health rating of 3 (very good) with the main disturbance causes being grazing (cattle) and weeds.

The weed species *Bidens bipinnata* was found at one site in this vegetation type. No Priority flora species were observed in this vegetation type.



Plate 4 Acacia tumida var. pilbarensis scrub in creeklines vegetation type (site LCF03)



Type 5: Wannamunna Mulga grove vegetation

This vegetation type occurred primarily in the Wannamunna land system and was recorded at four sites.

This vegetation type had a mean Keighery health rating of 3 (very good) with the main disturbance causes being weeds and grazing (cattle).

The weed species *Bidens bipinnata*, *Chloris virgata*, *Malvastrum americanum*, and *Portulaca oleracea* were found in this vegetation type. Priority flora species including *Aristida calycina* var. *calycina* (Priority 2), *Aristida lazaridis* (Priority 2), and *Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662) (Priority 1) were observed in three sites of this vegetation type.



Plate 5 Wannamunna mulga grove vegetation type (site LCF31)



Type 6: Acacia aptaneura over hummock grassland

This vegetation type was recorded at seven sites, throughout the extent of the survey area but particularly in the open plains at the western end of the main mining tenement area.

This vegetation type was the most highly disturbed of all types in the current survey, and had a mean Keighery health rating of 3.57 (very good-good) with the main disturbance causes being grazing (cattle), active mining exploration, and vehicle tracks.

The weed species *Bidens bipinnata* was found at three sites in this vegetation type. The Priority flora species *Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662) (Priority 1) was observed at one site in this vegetation type (LCF33).



Plate 6 Acacia aptaneura over hummock grassland (site LCF18)















5. DISCUSSION AND RECOMMENDATIONS

5.1. **SUMMARY OF RESULTS**

A total of 230 species, from 110 genera and 42 families, were recorded during the survey of the Lamb Creek area, from 414 specimens collected. Of those, 209 were collected within survey quadrats; the rest were collected opportunistically.

Six main vegetation communities were recognised and mapped following field observations and statistical analysis of the field data.

5.1.1. CONSERVATION SIGNIFICANT SPECIES AND COMMUNITIES

No species of Threatened Flora (Declared Rare Flora) pursuant to the Western Australian *Wildlife Conservation Act* 1950, and no species listed as Threatened pursuant to the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999 were recorded in the project area.

Three species of Priority Flora listed by DEC were recorded during the survey, comprising one Priority 1 species (*Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662)) and two Priority 2 species (*Aristida calycina* var. *calycina* and *Aristida lazaridis*).

Brachyscome sp. Wanna Munna Flats (S. van Leeuwen 4662), although listed as a Priority 1 taxon, is actually the most well-known of the three Priority flora species that were recorded in the Lamb Creek survey, having ten collections in the WA Herbarium, spanning across a relatively wide area. The population recorded in the Lamb Creek project appears to be a previously unknown one, as there are no corresponding records in any of the DEC flora databases. Conservation impact on this species of the proposed Lamb Creek project should be able to be minimised by relocation of the proposed access road to intersect with the Great Northern Highway at a more northern location, however further survey should be conducted to determine the extent of this population before any disturbance is undertaken as the occurrence of the species may not be exactly defined by the extent of the land system. Because *B*. sp. Wanna Munna Flats (S. van Leeuwen 4662) was observed to occur in small numbers, evenly spread across a wide area, and due to its ephemeral life cycle, it may be difficult to avoid disturbing the species if the proposed infrastructure cannot be relocated to outside of its known habitat.

Although ranked as lower Priority than *B*. sp. Wanna Munna Flats (S. van Leeuwen 4662), *Aristida calycina* var. *calycina* and *A. lazaridis* (both Priority 2 species) are less well-known in Western Australia. *Aristida calycina* var. *calycina* is only known from a single location in WA, approximately 65 km away from our record, and *A. lazaridis* is only known from two locations. As both of these species were found at the same single site only at Lamb Creek, avoiding conservation impacts entirely should be quite possible if proposed infrastructure is planned appropriately. Further survey should be conducted in the area to determine the full extent of these populations, particularly for *A. lazaridis*, which formed a dominant species in its stratum where it was recorded, and was probably widespread and common throughout the area of similar vegetation surrounding.

No Threatened or Priority Ecological Communities listed by the DEC were recorded.

Kendrick (2002) lists a number of 'ecosystems at risk' in the Hamersley IBRA subregion including some that have brief descriptions similar to vegetation types found in the survey area (for example 'Grove/inter-grove mulga, eastern Hamersley Range' and 'Valley floor Mulga'); however given the sparseness of these descriptions it is not possible to determine if the vegetation complexes recorded in fact match the ones described by Kendrick. These vegetation complexes are not formally listed as TECs or PECs and there is little further information available about them (Jill Pryde, pers. comm.). However, in the time elapsed since publication of the Biodiversity Audit of Western Australia's 53 biogeographical subregions, significant environmental change driven primarily by mining development has occurred in



the Pilbara, and Kendrick's (2002) estimations may now be poor indications of current conservation status. For this reason significant impact on these vegetation types (particularly the *Acacia aptaneura* complexes: vegetation types 5 and 6 in this document) should be avoided where possible.

5.1.2. WEEDS

Five species of introduced flora were recorded in the project area: *Bidens bipinnata* (Bipinnate Beggartick), *Cenchrus ciliaris* (Buffel Grass), *Chloris virgata* (Feathertop Rhodes Grass), *Malvastrum americanum* (Spiked Malvastrum), and *Portulaca oleracea* (Purslane). These species were located in a total of nine sites.

None of these taxa were listed as Declared Plants by the WA Department of Agriculture and Food pursuant to section 37 of the *Agricultural and Related Resources Protection Act 1976* (Western Australia), or as Weeds of National Significance by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC 2012).

5.2. **POTENTIAL PROJECT IMPACTS**

As currently proposed, the project could impact on known habitat of the three Priority flora species observed in the Lamb Creek flora survey. The project also has the potential to impact on the 'at risk' ecological communities 'Grove/inter-grove mulga, eastern Hamersley Range' and 'Valley floor mulga' mentioned in Kendrick (2002). The project would also impact on the Wannamunna land system, a relatively uncommon land system with high conservation and pastoral value.

There is some risk of weed dispersal, particularly from the relatively weed-species rich south-west of the survey area to the relatively undisturbed main mining area.

5.3. **Recommendations**

- 1. Further targeted priority flora survey for *Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662), *Aristida calycina* var. *calycina*, and *Aristida lazaridis* should be conducted prior to disturbance to areas of the Wannamunna land system, and the associated nearby *Acacia aptaneura* groves where these taxa where recorded in the current survey.
- 2. Rapallo recommends avoiding impact on the Wannamunna land system vegetation where most of the Priority species where encountered.
- 3. If it remains necessary to impact the Wannamunna land system vegetation, consultation with the DEC is recommended before any works are undertaken.
- 4. A weed management program should be developed to reduce the spread of invasive plants before any further disturbance and/or clearing takes place. This should include washing down any vehicles travelling from weed-infested areas into non-infested areas.
- 5. Consultation with the DEC is recommended before any disturbance occurs in creek lines near watercourses in the areas of the proposed access roads in order to determine whether these areas are to be considered as wetland vegetation as specified under the *Environmental Protection Act 1986* (Section 51-O).



- 6. Access roads and other infrastructure should be planned to avoid disturbance to locations recorded to contain Priority Flora species including a minimum 50 m buffer around those locations is recommended. If disturbance cannot be avoided, consultation with the DEC is recommended before any clearing is undertaken
- 7. During project clearing, topsoil, branches and other vegetation debris should be stockpiled and returned directly to the disturbed areas for rehabilitation operations.
- 8. Windrows of topsoil, log debris and leaf litter formed during clearing should be retained.
- 9. Where possible ensure no ground engagements (the grader held blade up) when clearing or reclearing the existing access tracks.
- 10. Ensure rapid rehabilitation of cleared areas such as laydown sites, access tracks and grid lines when they are no longer required.



6. **REFERENCES**

- Aplin, T.E.H. (1979). 'The Flora', in: *Environment and Science*, Ed: O'Brien, BJ, University of WA Press, Perth.
- Astron Environmental Services (2010a). West Pilbara Iron Ore Project Reconciliation of Vegetation Descriptions and Associated Vegetation Mapping. Unpublished report prepared for API Management Pty Ltd.
- Astron Environmental Services (2010b). *Area C to Yandi flora and vegetation survey*. Unpublished report prepared for BHP Billiton.
- Astron (2012). *Iron Valley Project Flora and Vegetation Survey*. Unpublished report for URS Australia Pty Ltd on behalf of Iron Ore Holdings Ltd.
- Beard, J.S. 1975. *Pilbara The Vegetation of the Pilbara Area 1:100 000 Vegetation Series*. University of W.A Press, Perth.
- Beard, J.S. (1990) Plant Life of Western Australia. Kangaroo Press Pty Ltd, NSW.
- Belbin, L. (1989). *PATN Technical Reference*. CSIRO Division of Wildlife and Ecology, P.O. Box 84, Lyneham, ACT, 2602. 167p.
- Biota Environmental Sciences (2004). Vegetation and flora survey of the proposed FMG stage A rail corridor. Unpublished report for Fortescue Metals Group.
- Biota Environmental Sciences (2010). Vegetation and flora surveys of the Oxbow and Junction South West deposits near Yandicoogina. Unpublished report for Rio Tinto Pty Ltd.
- Bureau of Meteorology (BOM) (2012). Climate Data Online <u>www.bom.gov.au/climate/data/</u> (Last accessed 02/05/2012)
- Colwell, R.K. (2006). EstimateS: Statistical estimation of species richness and shared species from samples. Version 8. <u>purl.oclc.org/estimates</u>
- Commonwealth of Australia (2007). Australian Weeds Strategy A national strategy for weed management in Australia. Natural Resource Management Ministerial Council. www.environment.gov.au/biodiversity/invasive/weeds/
- Commonwealth of Australia (2012a). Weeds in Australia. Australian Government. <u>www.weeds.gov.au</u> Last updated: 21/03/2012
- Commonwealth of Australia (2012b). Geoscience Australia. www.ga.gov.au (Last accessed 02/05/2012).
- Cowan, M., Graham, G. & McKenzie, N. (2001). Coolgardie (COO2 Southern Cross subregion). In: May, J. & McKenzie, N. (Eds.) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, WA.
- CSIRO Australia (2012). Australian Soil Resource Information System (ASRIS). <u>www.asris.csiro.au</u> (Last accessed 05/04/12).
- Department of Agriculture and Food Western Australia (DAFWA) (2011). Agriculture and Related Resources Protection Act 1976: Declared Plants. <u>http://www.agric.wa.gov.au/</u>
- Department of Conservation and Land Management (CALM) (1999). *Environmental Weed Strategy for Western Australia*. Department of Environment and Conservation, WA.



- Department of Environment and Conservation (DEC) (2012). *NatureMap: Mapping Western Australia's Biodiversity*. <u>naturemap.dec.wa.gov.au</u> (Last accessed 03/04/2012).
- Department of Environment and Conservation (DEC) (2010). Definitions, Categories and Criteria for Threatened and Priority Ecological Communities.
- Department of Environment and Conservation (DEC) (2012a). *Environmental Weed Strategy*. <u>ww.dec.wa.gov.au/content/view/847/2282/</u> (Last accessed 05/04/12)
- Department of Environment and Conservation (DEC) (2012b) Priority Ecological Communities for Western Australia Version 17, DEC Species and Communities Branch
- Department of Environment and Heritage (2003). Australian Vegetation Attribute manual. National Vegetation Information System, Version 6.0. Executive Steering Committee for Australian Vegetation Information. (Last accessed 05/04/12)
- Department of the Environment and Water Resources (2007). *Australia's Native Vegetation: A summary of Australia's Major Vegetation Groups*, 2007. Australian Government, Canberra, ACT.
- Department of Mines and Petroleum (2012). TENGRAPH Online. <u>www.dmp.wa.gov.au/3980.aspx</u> (Last accessed 15/03/2012).
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012a). *Interim Biogeographic Regionalisation for Australia (IBRA) Version 6.1.* <u>www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra</u>
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012b).*National Vegetation Information System*. <u>www.environment.gov.au/erin/nvis</u> (Last accessed 02/05/12)
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012c).Protected Matters Search Tool. <u>www.environment.gov.au/epbc/pmst/index.html</u> (Last accessed 02/05/12)
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012d). *Weeds.* <u>www.environment.gov.au/biodiversity/invasive/weeds/</u> (Last accessed 02/05/12)
- ENV Australia Pty Ltd (2008). Rapid Growth Project 5: Jimblebar Junction to Yandi Junction Railway Reserve, Flora and Vegetation Assessment Report. Unpublished report prepared for BHP Billiton, Perth, Western Australia.
- Environmental Protection Authority (2000). Position Statement No. 2: Clearing of Native Vegetation, with Particular Reference to the Agricultural Area. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (2002). Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (2004). *Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.* Environmental Protection Authority, Perth, WA.
- Gardiner S.J. (2003). Impacts of Mining and Mine Closure on Water Quality and the Nature of Shallow Aquifer, Yandi Iron Ore Mine. Published Master's Thesis, Curtin University, Perth.



- Hussey, B.M.J., Keighery, G.J., Dodd, J., Lloyd, S.G., and Cousens, R.D. (2007) Western Weeds a guide to the weeds of Western Australia. Second edition. The Weeds Society of WA Inc.
- Keighery, B. J. (1994). Bushland Plant Survey: A guide to plant community survey for the community. Wildflower Society of Western Australia (Inc.), Nedlands WA.
- Kendrick, P. (2002). Pilbara 3 (PIL3 Hamersley subregion). In: May, J. & McKenzie, N. (Eds). A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, WA.
- Mattiske Consulting (2005). *Flora and vegetation on the Cloud Break and White Knight leases*. Unpublished report prepared or Fortescue Metals Group Ltd.
- Mattiske Consulting (2008a). Flora and Vegetation Survey of Exploration Tenement E47/1237 Phil's Creek Project area. Unpublished report for URS Australia
- Mattiske Consulting (2008b). *Flora and vegetation of the Hope Downs 4 mine infrastructure corridor*. Unpublished report prepared for Pilbara Iron, December 2008.
- McKenzie, N.L., May, J.E. & McKenna, S. (Eds). (2003). *Bioregional Summary of the 2002 Biodiversity audit for Western Australia*. Department of Conservation and Land Management.
- Rapallo (2012). *Level 2 flora and vegetation survey of Phil's Creek Haul Road*. Unpublished report for Process Minerals International.
- Shepherd, D., Beeston, G. & Hopkins, A. (2001) *Native Vegetation in Western Australia: Extent, Type, and Status.* Department of Agriculture, South Perth, Western Australia.
- Specht, R.L. 1970, 'Vegetation', in: Leeper, GW (ed.) (1970), *The Australian Environment*, fourth edition, pp. 44-67. CSIRO Melbourne University Press, Melbourne.
- Thackway, R. & Cresswell I. D. (1995). An Interim Biogeographical Regionalisation for Australia: a Framework for Setting Priorities in the National Reserves System Cooperative Program. Australian Nature Conservation Agency, Canberra, ACT.
- The Royal Botanic Gardens and Domain Trust (2012). *PlantNET The Plant Information Network System of The Royal Botanic Gardens and Domain Trust*, Sydney, Australia (version 2.0). http://plantnet.rbgsyd.nsw.gov.au
- Thorne, A.M. & Tyler, M. (1997). Roy Hill, Western Australia: Sheet SF/50-12. 1:250,000. Geological series explanatory notes, 22 pages. Geological Survey of Western Australia, 1997.
- Thorp, J. R. & Wilson, M. (1998-2012) Weeds Australia www.weeds.org.au
- Van Vreeswyk, A.M.E., Payne, A.L., Leighon, K.A., and Hennig, P. (2004). An inventory and condition survey of the Pilbara region, Western Australia. Technical Bulletin 92. Department of Agriculture and Food, Perth.
- Western Australian Government (2005). Environmental Protection (Environmentally Sensitive Areas) Notice 2005. Western Australian Government Gazette. Perth, Friday, 8 April 2005, No. 55. State Law Publisher, WA.
- Western Australian Government (2012). Wildlife Conservation (Rare Flora) Notice 2012. Western Australian Government Gazette. Perth, Friday 17 February 2012, No. 23. State Law Publisher, WA.



Western Australian Herbarium (2012). FloraBase - The Western Australian Flora. Department of Environment and Conservation. <u>florabase.dec.wa.gov.au/</u> (Last accessed 2/06/2012).



Appendices



Appendix I: State and Federal Conservation Codes



Conservation Listings under the Environment Protection and Conservation Act 1999 (EPBC Act)

Threatened fauna and flora may be listed in any one of the following categories as defined in Section 179 of the EPBC Act. Section 179 Categories of threatened species

Extinct

(1) A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the Wild

- (2) A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:
 - (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
 - (b) 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.

Critically Endangered

(3) A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

Endangered

- (4) A native species is eligible to be included in the endangered category at a particular time if, at that time:
 - (a) it is not critically endangered; and
 - (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

Vulnerable

- (5) A native species is eligible to be included in the vulnerable category at a particular time if, at that time:
 - (a) it is not critically endangered or endangered; and
 - (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.

Conservation Dependent

- (6) A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:
 - (a) 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; or
 - (b) the following subparagraphs are satisfied:
 - (i) the species is a species of fish;
 - (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;



- (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory;
- (iv) cessation of the plan of management would adversely affect the conservation status of the species.
- (7) In subsection (6): fish includes all species of bony fish, sharks, rays, crustaceans, molluscs and other marine organisms, but does not include marine mammals or marine reptiles.

Species listed as 'conservation dependent' and 'extinct' are not matters of national environmental significance and therefore do not trigger the EPBC Act.



Categories and definitions of Threatened Flora species under the *Wildlife Conservation Act (1950)* of Western Australia, taken directly from the DEC WA Herbarium website.

Under the *Wildlife Conservation Act(1950)* the Minister for the Environment may declare species of flora to be protected if they are considered to be in danger of extinction, rare or otherwise in need of special protection. Schedules 1 and 2 deal with those that are threatened and those that are presumed extinct, respectively.

T:Threatened Flora (Declared Rare Flora - Extant)

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 (Schedule 1 under the *Wildlife Conservation Act 1950*).

Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using <u>IUCN Red List criteria</u>:

- CR: Critically Endangered considered to be facing an extremely high risk of extinction in the wild
- EN: Endangered considered to be facing a very high risk of extinction in the wild
- VU: Vulnerable considered to be facing a high risk of extinction in the wild.

X:Presumed Extinct Flora (Declared Rare Flora - Extinct)

Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 under the *Wildlife Conservation Act 1950*).

Species that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna. Species that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5.

Priority One - Poorly Known Taxa

Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

Priority Two - Poorly Known Taxa

Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

Priority Three - Poorly Known Taxa

Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.



Priority Four – Rare, Near Threatened and other species in need of monitoring

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

Priority Five – Conservation Dependent species

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



Definitions and criteria for presumed totally destroyed, critically endangered, endangered and vulnerable ecological communities, taken from DEC (2010).

THREATENED ECOLOGICAL COMMUNITIES

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

Presumed Totally Destroyed (PD)

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

Critically Endangered (CR)

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

Endangered (EN)

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

Vulnerable (VU)

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

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



Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. 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 with 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 may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, 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.

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

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

(iii) 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.



Appendix II: Vegetation condition scale (Keighery 1994)



Vegetation condition scale (Keighery, 1994)

Vegetation Condition	Definition	
Pristine (1)	Pristine or nearly so, no obvious signs of disturbance.	
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.	
Very Good (3)	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	
Good (4)	Vegetation structure significantly altered by very obvious signs of multiple disturbances. 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.	
Degraded (5)	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	
Completely Degraded (6)	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.	



Appendix III: List of Flora Species Recorded during the Survey



Family	LSS	Taxonomic Name			
Lauraceae	80	Cassytha capillaris			
Cyperaceae		Bulbostylis barbata			
		Cyperus cunninghamii subsp. cunninghamii			
		Eragrostis cumingii			
	156	Eragrostis eriopoda			
	130	Eragrostis pergracilis			
		Eragrostis tenellula			
		Fimbristylis dichotoma			
		Fimbristylis simulans			
		Amphipogon caricinus subsp. caricinus			
		Amphipogon sericeus			
		Aristida calycina var. calycina (P2)			
		Aristida contorta			
		Aristida holathera			
		Aristida inaequiglumis			
		Aristida lazaridis (P2)			
		*Cenchrus ciliaris			
		Chloris pectinata			
		*Chloris virgata			
Daaaaaa	163	Chrysopogon fallax			
Poaceae	103	Cymbopogon ambiguus			
		Cymbopogon obtectus			
		Dactyloctenium radulans			
		Digitaria ctenantha			
		Enneapogon caerulescens			
		Enneapogon polyphyllus			
		Enteropogon ramosus			
		Eriachne aristidea			
		Eriachne helmsii			
		Eriachne obtusa			
		Eriachne pulchella subsp. pulchella			



Family	LSS	Taxonomic Name		
		Eulalia aurea		
		Iseilema membranaceum		
		Paraneurachne muelleri		
		Paspalidium basicladum		
		Paspalidium rarum		
		Paspalidium tabulatum		
		Perotis rara		
		Schizachyrium fragile		
		Sporobolus australasicus		
		Themeda triandra		
		Tragus australianus		
		Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)		
		Triodia brizoides		
		Triodia wiseana		
		Triraphis mollis		
		Urochloa holosericea subsp. velutina		
		Urochloa piligera		
Menispermaceae	169	Tinospora smilacina		
		Grevillea stenobotrya		
Drotococc	175	Grevillea wickhamii		
Proteaceae		Grevillea wickhamii subsp. hispidula		
		Hakea lorea		
		Tribulopis angustifolia		
Zuganhullaaaaa	100	Tribulus astrocarpus		
Zygophyllaceae	199	Tribulus hirsutus		
		Tribulus platypterus		
Fabaceae	201	Acacia adoxa var. adoxa		
		Acacia adsurgens		
		Acacia ancistrocarpa		
		Acacia aptaneura		
		Acacia arida		


Family	LSS	Taxonomic Name
		Acacia bivenosa
		Acacia dictyophleba
		Acacia elachantha
		Acacia hilliana
		Acacia inaequilatera
		Acacia maitlandii
		Acacia marramamba
		Acacia minyura
		Acacia monticola
		Acacia pachyacra
		Acacia pruinocarpa
		Acacia pyrifolia var. morrisonii
		Acacia steedmanii subsp. borealis
		Acacia synchronicia
		Acacia tenuissima
		Acacia tumida var. pilbarensis
		Acacia xiphophylla
		Crotalaria medicaginea
		Gompholobium sp. Pilbara (NF Norris 908)
		Indigofera georgei
		Indigofera monophylla
		Rhynchosia minima
		Senna artemisioides subsp. filifolia
		Senna artemisioides subsp. helmsii
		Senna artemisioides subsp. oligophylla
		Senna artemisioides subsp. sturtii
		Senna ferraria
		Senna glutinosa subsp. glutinosa
		Senna glutinosa subsp. pruinosa
		Senna notabilis
		Senna venusta



Family	LSS	Taxonomic Name
		Tephrosia densa
		Tephrosia supina
Surianaceae	202	Stylobasium spathulatum
Polygalaceae	203	Polygala isingii
Moraceae	211	Ficus brachypoda
Cucurbitaceae	224	Cucumis maderaspatanus
Celastraceae	229	Stackhousia intermedia
		Euphorbia australis
		Euphorbia biconvexa
Euphorbiaceae	242	Euphorbia boophthona
		Euphorbia latrobei subsp. filiformis
		Euphorbia tannensis subsp. eremophila
Phyllanthaceae	247	Phyllanthus maderaspatensis
Violaceae	261	Hybanthus aurantiacus
		Corymbia ?opaca
		Corymbia deserticola
		Corymbia hamersleyana
Mautococo		Eucalyptus ?victrix
Myrtaceae	281	Eucalyptus ?xerothermica
		Eucalyptus gamophylla
		Eucalyptus kingsmillii subsp. kingsmillii
		Eucalyptus leucophloia subsp. leucophloia
Somindaaaaa	200	Dodonaea coriacea
Sapindaceae	299	Dodonaea viscosa subsp. mucronata
		Abutilon dioicum
		Abutilon indicum
		Abutilon otocarpum
Malvaceae	309	Corchorus incanus subsp. lithophilus
		Corchorus lasiocarpus subsp. lasiocarpus
		Gossypium australe
		Gossypium robinsonii



Family	LSS	Taxonomic Name
		Hibiscus burtonii
		Hibiscus coatesii
		Hibiscus sturtii var. campylochlamys
		Hibiscus sturtii var. platychlamys
		Keraudrenia nephrosperma
		*Malvastrum americanum
		Rulingia luteiflora
		Sida ?echinocarpa
		Sida ?sp. Spiciform panicles (E. Leyland s.n. 14/8/90)
		Sida ?sp. Supplejack Station (T.S. Henshall 2345)
		Sida arenicola
		Sida fibulifera
		Sida platycalyx
		Sida sp. Golden calyces glabrous (H.N. Foote 32)
		Sida sp. Pilbara (A.A. Mitchell PRP 1543)
		Sida sp. Tiny fruits (AA Mitchell PRP1152)
		Triumfetta maconochieana
Gyrostemonaceae	328	Codonocarpus cotinifolius
Commonsooo	220	Capparis lasiantha
Capparaceae	330	Capparis spinosa var. nummularia
		Cleome oxalidea
		Cleome viscosa
Brassicaceae	332	Lepidium echinatum
		Stenopetalum anfractum
		Stenopetalum pedicellare
Santalaceae	338	Santalum lanceolatum
Lorenthesess	220	Amyema sanguinea var. sanguinea
Loranthaceae	339	Lysiana murrayi
		Polycarpaea corymbosa var. corymbosa
Caryophyllaceae	355	Polycarpaea holtzei
		Polycarpaea longiflora



Family	LSS	Taxonomic Name
		Alternanthera nana
		Gomphrena canescens subsp. canescens
		Gomphrena cunninghamii
		Ptilotus astrolasius
		Ptilotus calostachyus
		Ptilotus clementii
1	257	Ptilotus exaltatus var. exaltatus
Amaranthaceae	357	Ptilotus fusiformis
		Ptilotus gaudichaudii var. gaudichaudii
		Ptilotus helipteroides
		Ptilotus macrocephalus
		Ptilotus obovatus subsp. obovatus
		Ptilotus polystachyus
		Ptilotus rotundifolius
		Dysphania glomulifera subsp. eremaea
		Dysphania kalpari
		Dysphania rhadinostachya
	250	Enchylaena tomentosa
Chenopodiaceae	358	Maireana villosa
		Rhagodia eremaea
		Salsola australis
		Sclerolaena cornishiana
Aizoaceae	364	Trianthema glossostigma
Nyctaginaceae	367	Boerhavia gardneri
	274	Calandrinia ptychosperma
Portulacaceae	374	*Portulaca oleracea
D 1.	100	Oldenlandia crouchiana
Rubiaceae	409	Psydrax latifolia
Rubiaceae	409	Psydrax rigidula
A	412	Cynanchum floribundum
Apocynaceae	413	Rhyncharrhena linearis



Family	LSS	Taxonomic Name
D .	41.5	Heliotropium tenuifolium
Boraginaceae	415	Trichodesma zeylanicum var. zeylanicum
		Bonamia rosea
		Convolvulus angustissimus subsp. angustissimus
Convolvulaceae	416	Duperreya commixta
		Evolvulus alsinoides var. villosicalyx
		Ipomoea polymorpha
		Nicotiana occidentalis subsp. obliqua
	417	Solanum ferocissimum
Solanaceae	417	Solanum lasiophyllum
		Solanum phlomoides
Oleaceae	423	Jasminum didymum subsp. lineare
	407	Stemodia grossa
Plantaginaceae	427	Stemodia viscosa
	428	Eremophila forrestii subsp. forrestii
a 11.		Eremophila fraseri subsp. fraseri
Scrophulariaceae		Eremophila lachnocalyx
		Eremophila longifolia
		Clerodendrum ?tomentosum
т. [.]	422	Clerodendrum floribundum var. angustifolium
Lamiaceae	432	Newcastelia sp. Hamersley Range (S. van Leeuwen 4264)
		Spartothamnella teucriiflora
		Dampiera candicans
		Goodenia forrestii
		Goodenia microptera
	450	Goodenia muelleriana
Goodeniaceae	458	Goodenia prostrata
		Goodenia stobbsiana
		Scaevola browniana subsp. browniana
		Scaevola parvifolia subsp. pilbarae
Asteraceae	460	*Bidens bipinnata



Family	LSS	Taxonomic Name
		<i>Brachyscome</i> sp. Wanna Munna Flats (S. van Leeuwen 4662) (P1)
		Pterocaulon serrulatum
		Rhodanthe floribunda
Araliaceae	472	Trachymene oleracea



Appendix IV: Coordinates of Conservation Significant Taxa recorded in the Project Area



Taxon name	Conservation status	Quadrat	Latitude	Longitude
		LCF33	-22.878188	118.801596
<i>Brachyscome</i> sp. Wanna Munna Flats (S. van Leeuwen 4662)	P1	LCF34	-22.879474	118.801194
,		LCF51	-22.878959	118.802863
Aristida calycina var. calycina	P2	LCF31	-22.865242	118.802478
Aristida lazaridis	P2			



Appendix V: Vegetation Structural Classes



Vegetation Structural Classes – Specht (1970) as modified by Aplin (1979)

	Canopy Cover (%)				
Stratum	70-100%	30-70%	10-30%	2-10%	<2%	
Trees >30m	Tall closed <u>forest</u>	Tall open <u>forest</u>	Tall woodland	Tall open woodland	<u>Scattered</u> tall trees	
Trees 10-30m	Closed <u>forest</u>	Open <u>forest</u>	Woodland	Open woodland	Scattered trees	
Trees <10m	Low closed <u>forest</u>	Low open <u>forest</u>	Low woodland	Low open woodland	<u>Scattered</u> low trees	
Shrubs >2m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	<u>Scattered</u> tall shrubs	
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs	
Shrubs <1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	<u>Scattered</u> low shrubs	
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	<u>Scattered</u> hummock grasses	
Grasses Sedges, Herbs	grassland /sedgeland	grassland/ bunch grassland/ sedgeland/	Open tussock grassland / bunch grassland/ sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	<u>Scattered</u> tussock grasses / bunch grasses / sedges / herbs	



Appendix VI: Flora Quadrat Survey Site Descriptions



Botanist	Chid	Date	3/27/2012	2	Site area		Quadrat 5	0 x 50 m
Location	50K		695006 n	nE	7477811		Elevation	
Topography and Geology	Soil: red b	: Low platear prown clay lo 95% cover o	ı / flat hilltoj am.	р	I			
Veg Condition	2	Dist	urbances	catte		Land S	System	Newman
Site Photo								
Vegetation	low shrub	s over <i>Triodi</i>	a wiseana, T					liana scattered
Species		loxa var. ado: acistrocarpa	xa		Polycar			



Botanist	Linda	Date	3/27/2012	•	Site LCF0 Site area		Quadrat 50) x 50 m
Location	50K	Date	694402 n		7477855 n		Elevation	
Topography and Geology	Landform: Aspect and Soil: orang	Rolling hill I Slope: vari brown cla	s able.		14//033 II			/51 m
Veg Condition	2	Dist	turbances	none		Land Sy	stem	Newman
Site Photo	Functional Provide Additional Provide Addit			ophloia, Cor				trans autors
Vegetation	Triodia wi	seana, Triod	lia brizoides	hummock g	rassland.			
Species	Bulbostylis Capparis l Cassytha c Corymbia Dysphania Eriachne h	asiantha capillaris deserticola rhadinostad pelmsii 5 leucophloid		ophloia		nia nephi aea holtze alostachy otundifoli utinosa su utinosa su lasiophyli	ei rus ius bsp. glutin bsp. pruin	



Botanist	Chid	Date	3/27/2012	2	Site area	L	Quadrat 50 x 50 m		
Location	50K		694242 n	nE	7477624	mN	Elevation		
Topography and Geology	Landform Soil: orar	n: Creekline nge clay loam 5% cover of							
Veg Condition	3	Dist	turbances	cattle, wee	eds	Land S	ystem	Platform	
Site Photo									
Vegetation		<i>mida</i> var. <i>pill</i> <i>triandra</i> tuss							
Species		mida var. pill drum floribun			Keraudr		hrosperma	p. <i>leucophloia</i>	



Botanist	Chid	Date	3/27/2012	2	Site area		Quadrat 5	0 x 50 m
Location	50K		693654 n	nE	7477707	mN	Elevation	719 m
Topography and Geology	Soil: red b	rown clay l	ateau / plain Dam. Of laterite, iro	nstone grave	l, pebbles.			
Veg Condition	3	Dis	turbances	cattle, track nearby, we		Land S	ystem	Platform
Site Photo								
		and the second						
Vegetation	grassland.	s gamophyli	<i>a</i> scattered lo	ow trees over		rizoides,		<i>reana</i> hummock



Botanist	Linda Da	ate 3/28/20	012	Site area	ı	Ouadrat 5	50 x 50 m
Location	50K	692223		7477666		Elevation	
Topography and Geology	Landform: Flat Aspect and Slop Soil: red clay.	low plateau / pla	in	I			
Veg Condition	3	Disturbances	grazing, signs of		Land S	System	МсКау
Site Photo							
	Commbia daga				abantha t	all open sh	rubland quer
Vegetation	Acacia hilliana,	ogon ambiguous	, Senna arten	<i>iisioides</i> sub grassland ar	sp. <i>helm</i>	s <i>ii</i> low shru scattered h	bland over Eulalid



Botanist	Linda	Date	3/28/201	2	Site area		Quadrat 5	50 x 50 m
Location	50K	Date	692877 m		7477377		Elevation	
Topography and Geology	Landform: Soil: red c		I				I	, <u>, , , , , , , , , , , , , , , , , , </u>
Veg Condition	4	Distu	rbances	fire 1-2 yea previous, c clearing, so piles, track years ago).	old crap s (>3	Land S	System	МсКау
Site Photo								
Vegetation	nephrospe		a rosea, Sei	nna artemisio	<i>ides</i> subsp			ver <i>Keraudrenia</i> pen shrubland ove
Species	Acacia ela Aristida co Bonamia r Corymbia Cymbopog Eucalyptus Evolvulus	cistrocarpa chantha ontorta			Keraudh Ptilotus Senna a Senna g Senna n Sida are Sida sp. Trianthe	calostaci rtemisioi lutinosa otabilis enicola	hrosperma hyus des subsp. gluti (A.A. Mitch sostigma	oligophylla nosa nell PRP 1543)



Lamb Creek	1		<u> </u>	•	1		_		
Botanist	Linda	Date	3/28/2012		Site area		-	50 x 50 m	
Location	50K		694241 n	nE	7477202	mN	Elevation	n 710 m	
Topography and Geology	Soil: red c	: Small disse lay. 100% cover o			ently undul	ating cou	intry		
Veg Condition	2	Dist	urbances	none		Land S	ystem	Pla	tform
Site Photo									
Vegetation	wiseana h herbs.	s gamophylla	ssland and H		ırantiacus,	Crotalar	ia medicag		
	wiseana hherbs.Acacia ada	ummock gras	ssland and H		urantiacus, Gossypi	Crotalar um austro	ia medicag		
Vegetation	wiseana h herbs. Acacia ad Acacia biv	ummock gras loxa var. adox venosa	ssland and H		ırantiacus, Gossypia Hakea l	Crotalar um austro orea	ia medicag ale		
Vegetation	wiseana h herbs. Acacia ada Acacia biv Acacia ela	ummock gras oxa var. ado: venosa achantha	ssland and H		ırantiacus, Gossypia Hakea l Hybanth	Crotalar um austro orea us auran	ia medicas ale tiacus		
Vegetation	wiseana h herbs. Acacia ada Acacia biv Acacia ela Bulbostyli.	ummock gras oxa var. ado: venosa achantha is barbata	ssland and H		urantiacus, Gossypia Hakea l Hybanth Indigofe	Crotalar um austro orea us auran ra monoj	ia medicas ale viacus vylla		
Vegetation	wiseana hi herbs. Acacia ada Acacia biv Acacia ela Bulbostyli Cassytha d	ummock gras oxa var. ado: venosa achantha is barbata	ssland and <i>H</i>	lybanthus au	ırantiacus, Gossypia Hakea l Hybanth	Crotalar um austra orea us auran ra monoj lium basi	ia medicas ale viacus vylla		
Vegetation	wiseana h herbs. Acacia ada Acacia biv Acacia ela Bulbostyli Cassytha a Corchorus Crotalaria	ummock gras loxa var. ado: venosa uchantha is barbata capillaris s lasiocarpus u medicagine	ssland and H xa subsp. lasio a	lybanthus au	Gossypia Hakea l Hybanth Indigofe Paspalia Perotis n Rhyncha	Crotalar um austra orea us auran ra monoj lium basu cara osia minin	tia medicas ale atiacus ohylla icladum ma	g <i>inea</i> scat	tered
Vegetation	wiseana h herbs. Acacia ada Acacia biv Acacia ela Bulbostyli. Cassytha o Corchorus Crotalaria Cymbopog	ummock gras loxa var. ado: venosa achantha is barbata capillaris s lasiocarpus a medicagine gon ambiguu.	ssland and H xa subsp. lasio a s	lybanthus au	Gossypia Hakea l Hybanth Indigofe Paspalia Perotis r Rhyncha Senna an	Crotalar um austra orea us auran ra monoj lium basi cara osia minin rtemisioia	ia medicas ale tiacus phylla icladum	g <i>inea</i> scat	tered
Vegetation	wiseana h herbs. Acacia ada Acacia biv Acacia ela Bulbostyli Cassytha a Corchorus Crotalaria Cymbopog Enneapog	ummock gras loxa var. ado: venosa uchantha is barbata capillaris s lasiocarpus u medicagine	ssland and H xa subsp. lasio a s ens	lybanthus au	Gossypia Hakea l Hybanth Indigofe Paspalia Perotis n Rhyncha	Crotalar um austra orea us auran ra monop lium basu cara osia minin rtemisioia ia densa	tia medicas ale atiacus ohylla icladum ma	g <i>inea</i> scat	tered



Botanist	Linda	Date	3/28/2012	2	Site area	Quadrat	50 x 50 m
Location	50K		693763 n	nE	7476932 m	-	
Topography and Geology	Aspect an Soil: red o	d Slope: W (270°) gentle		ed minor dra	inage lines	1
Veg Condition	3	Dist	turbances	old tracks, c	learing L	and System	Platform
Site Photo							
Vegetation	Corymbia grassland		scattered low	trees over Tr	iodia wisea	na, Triodia brizo	<i>ides</i> hummock
Species	Acacia hi Acacia ela Bulbostyli Corymbia	achantha is barbata deserticola a rhadinostae			Senna glut Senna glut	ea	inosa



Botanist	Chid	Date	3/28/2012	2	Site are	a	Quadrat 5	0 x 50 m
Location	50K		695052 n	nE	7476783	3 mN	Elevation	
Topography and Geology	Slope: ve Soil: brov	n: Gently slop ery gentle. wn clay loam. 95% cover o						
Veg Condition	2	Dis	urbances	cattle, fire	(old)	Land	System	Platform
Site Photo								
Vegetation	• •	d over <i>Triodic</i>	-	-	<i>ana</i> humm		sland.	liana low open



Botanist	Chid	Date	3/29/2012	2	Site area	Quadrat 5	50 x 50 m
Location	50K		694315 n		7476643 mN		
Topography and Geology	Landforr Slope: ve Soil: bro	ery gentle. wn sandy cla	ekline in shall y.	low valley bo			, , , , , , , , , , , , , , , , , , ,
Veg Condition	2	Dis	sturbances	tracks and c pads nearby		and System	Boolgeeda
Site Photo							
Vegetation	• •	-	-			<i>leyana</i> scattered losed hummock	
Species	Acacia ir Corchort Corymbi Cymbopo Enneapo Eriachne	ncistrocarpa naequilatera us lasiocarpu a hamersleyc ogon ambigu gon polyphyc	us subsp. <i>lasic</i> una us llus	ocarpus	0	dichotoma obinsonii 1 holtzei	



Botanist	Chid	Date	3/29/2012	2	Site are	ea	Quadrat 5	0 x 50 m
Location	50K	I	693464 n	nE	747647	1 mN	Elevation	745 m
Topography and Geology	Aspect an Soil: red	n: Sloping val nd Slope: Eas brown clay lo 95% cover o	t moderately am.	inclined to	steep.		ulders.	
Veg Condition	1	Dis	turbances	relatively fire.	recent	Land	System	Boolgeeda
Site Photo								
Vegetation		us leucophloi l over Triodia				rees ove	er Grevillea	wickhamii open
Species	Eucalypta Euphorbi Goodenia	a deserticola us leucophloi a biconvexa a stobbsiana wickhamii	<i>a</i> subsp. <i>leuc</i>	cophloia	Ptilotu Schiza Senna	ıla isingii s calostac chyrium f glutinosa ı wiseana	<i>ragile</i> subsp. gluti	nosa



Botanist	Chid	Date	3/28/2012	Survey - S	Site area		Quadrat 5	0 x 50 m
Location	50K		695001 n		7476202	mN	Elevation	
Topography and Geology	Landform Aspect ar Soil: red	n: Deep gorge nd Slope: Nor brown sandy 95% cover o	valley botto th gently inc clay.	om lined.				
Veg Condition	2	Dist	turbances	cattle, weed	ls	Land S	ystem	Boolgeeda
Site Photo								
Vegetation		us leucophloid m robinsonii						m spathulatum, ssland.



Botanist	Linda	Date	3/28/201		Site LCI Site are		Quadrat 5	0 x 50 m
Location	50K	Datt	694402 m		7476052		Elevation	
Topography and Geology	Landform Aspect ar Soil: red	n: Ridge top nd Slope: WS clay. 95% cover o	E (240°) ger	ntle on ridge				
Veg Condition	1	Dist	urbances	old fire (> previous)	5 years	Land S	System	Boolgeeda
Site Photo								
	Eucalypti	us leucophloid	a subsp. <i>leuc</i>	cophloia, Eu	calyptus g	amophyll	a low open	woodland over
Vegetation	Triodia w	us leucophloia viseana humm us gamophylla	lock grassla			amophyll nia stobbs		woodland over



Botanist	Chid	Date	3/29/2012	2	Site area		Quadrat 5	50 x 50 m
Location	50K		693315 n	nE	7475767	mN	Elevation	
Topography and Geology	Soil: brov	a: Creekline w vn sandy clay 90% cover of		-		urrounde	ed by hills.	
Veg Condition	3	Dist	urbances	cattle, wee clearing ne (tracks and pads)	earby	Land S	System	Boolgeeda
Site Photo	the second se							
Vegetation	Acacia mo shrubland	rea scattered l onticola tall o l over Themed c grassland.	pen scrub o	ver Gossypiı	ım robinsol	<i>nii</i> and n	nixed speci	
0	Acacia ma shrubland hummock Abutilon	<i>onticola</i> tall o l over <i>Themed</i> c grassland. <i>indicum</i>	pen scrub o	ver Gossypiı	um robinson lmsii tussoo Hakea lo	nii and n ck grassla orea	nixed specie and and Tra	es low open
0	Acacia ma shrubland hummock Abutilon a Acacia in	onticola tall o l over Themed c grassland. indicum aequilatera	pen scrub o	ver Gossypiı	ım robinsor lmsii tussoc Hakea lo Hybanth	nii and n ck grassl prea pus aurar	nixed specie and and Tra	es low open
0	Acacia ma shrubland hummock Abutilon i Acacia in Acacia ma	onticola tall o l over Themed s grassland. indicum aequilatera onticola	pen scrub oʻ la triandra, .	ver Gossypiı	ım robinsor İmsii tussoo Hakea la Hybanth Indigofe	nii and n ck grassl prea pus aurar ra mono	nixed specie and and Tra ntiacus phylla	es low open <i>iodia wiseana</i> ope
0	Acacia ma shrubland hummock Abutilon t Acacia in Acacia tu Acacia tu	onticola tall o l over Themed s grassland. indicum aequilatera onticola mida var. pilb	pen scrub oʻ la triandra, .	ver Gossypiı	um robinsoi Imsii tussoo Hakea la Hybanth Indigofe Jasminu	nii and n ck grassla prea prea prea aurar ra mono m didym	nixed specie and and Tra ntiacus phylla um subsp. h	es low open <i>iodia wiseana</i> ope
0	Acacia ma shrubland hummock Abutilon u Acacia in Acacia tu *Bidens b	onticola tall o l over Themed s grassland. indicum aequilatera onticola mida var. pilb pipinnata	pen scrub oʻ la triandra, .	ver Gossypiı	um robinsoi lmsii tussoo Hakea la Hybanth Indigofe Jasminu Paspalia	nii and n ck grassk orea us aurar ra monoj m didym lium tabu	nixed specie and and Tra ntiacus phylla um subsp. i ulatum	es low open iodia wiseana ope
0	Acacia ma shrubland hummock Abutilon a Acacia in Acacia ma Acacia tu *Bidens b Boerhavi	onticola tall o l over Themea c grassland. indicum aequilatera onticola mida var. pilb pipinnata ia gardneri	pen scrub oʻ la triandra, .	ver Gossypiı	um robinsor Imsii tussoo Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant	nii and n ck grassk prea us aurar m didym dium tabu hus mad	nixed specie and and Tra ntiacus phylla um subsp. i ulatum eraspatenss	es low open iodia wiseana ope
0	Acacia ma shrubland hummock Abutilon a Acacia in Acacia ma Acacia tu *Bidens b Boerhavi	onticola tall o l over Themed a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata	pen scrub oʻ la triandra, .	ver Gossypiı	um robinsoi lmsii tussoo Hakea la Hybanth Indigofe Jasminu Paspalia	nii and n ck grassk prea us aurar ra mono m didym dium tabu chus mad paea long	nixed specie and and Tra ntiacus phylla um subsp. i ulatum leraspatenss giflora	es low open <i>iodia wiseana</i> ope
0	Acacia ma shrubland hummock Abutilon u Acacia in Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v	onticola tall o l over Themed a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata	pen scrub oʻ la triandra, . parensis	ver Gossypiu Eriachne hei	um robinsod lmsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocau	nii and n ck grassk prea tus aurar ra mono m didym dium tabu hus mad paea long ulon serr	nixed specie and and Tra ntiacus phylla um subsp. i ulatum leraspatenss giflora	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon u Acacia in Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari	onticola tall o l over Themed grassland. indicum aequilatera onticola mida var. pilb pipinnata ia gardneri is barbata iscosa s incanus sub a medicagined	pen scrub o la triandra, . parensis sp. lithophil	ver Gossypiu Eriachne hei	um robinsod Imsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocat Ptilotus Rhagodi	nii and n ck grassl prea us aurar ra monoj m didym dium tabu hus mad paea long ulon serr obovatus a erema	nixed specie and and Tra ntiacus phylla um subsp. i ulatum giflora giflora ulatum s subsp. obo ea	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon t Acacia in Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis t	onticola tall o l over Themed grassland. indicum aequilatera onticola mida var. pilb pipinnata ia gardneri is barbata iscosa s incanus sub a medicaginea maderaspatan	pen scrub o la triandra, parensis sp. lithophil a uus	ver Gossypiu Eriachne hei	um robinsod Imsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocat Ptilotus Rhagodi Rhyncho	nii and n ck grassl prea us aurar ra mono m didym dium tabu hus mad paea lon vaea lon vaea lon soaea lon vaea lon soa a erema osia mini	nixed specie and and Tra ntiacus phylla um subsp. i ulatum leraspatenss giflora giflora giflora s subsp. obo ea ma	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon t Acacia in Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis t Dodonaed	onticola tall o l over Themed grassland. indicum aequilatera onticola mida var. pilb oppinnata ia gardneri is barbata is cosa s incanus sub a medicaginea maderaspatan a viscosa subs	pen scrub o la triandra, parensis sp. lithophil a us sp. mucrona.	ver Gossypiu Eriachne hei	um robinsod Imsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocau Ptilotus Rhagodi Rhyncho Santalun	nii and n ck grassl prea us aurar ra mono m didym dium tabu hus mad paea long ulon serr obovatus fa erema ssia mini n lanceo	nixed specie and and Tra ntiacus phylla um subsp. i ulatum leraspatenss giflora giflora giflora s subsp. obo ea ma	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon a Acacia in Acacia ma Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis a Dodonaea Dysphani	onticola tall o l over Themea a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata iscosa s incanus sub a medicaginea maderaspatan a viscosa subs a rhadinostac	pen scrub o la triandra, parensis sp. lithophil a us sp. mucrona.	ver Gossypiu Eriachne hei	um robinsod Imsii tussoo Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocat Ptilotus Rhagodi Rhyncho Santalur Senna ve	nii and n ck grassl orea us aurar ra mono m didym dium tabu hus mad baea long ulon serr obovatus ca ereman osia mini n lanceo enusta	nixed specie and and Tra ntiacus phylla um subsp. i ulatum deraspatenss giflora giflora gulatum s subsp. obd ea ma latum	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon a Acacia in Acacia ma Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis a Dodonaea Dysphani Eriachne	onticola tall o l over Themed a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata iscosa s incanus sub a medicaginea maderaspatan a viscosa subs a rhadinostac helmsii	pen scrub o la triandra, parensis sp. lithophil a sp. mucrona hya	ver Gossypiu Eriachne hei us ta	um robinsor Imsii tussoo Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocau Ptilotus Rhagodi Rhyncho Santalun Senna ve Stylobas	nii and n pik grassk prea us aurar ra mono m didym dium tabu hus mad paea long ulon serr obovatus a eremat osia mini n lanceo enusta ium spat	nixed specie and and Tra ntiacus phylla um subsp. i ulatum deraspatenss giflora giflora gulatum s subsp. obd ea ma latum	es low open <i>iodia wiseana</i> ope lineare is
Vegetation Species	Acacia ma shrubland hummock Abutilon n Acacia in Acacia ma Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis a Dodonaea Dysphani Eriachne Evolvulus	onticola tall o l over Themed a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata iscosa s incanus sub a medicaginea maderaspatan a viscosa subs a rhadinostac helmsii s alsinoides va	pen scrub o la triandra, parensis sp. lithophil a us p. mucronal hya ar. villosical	ver Gossypiu Eriachne hei us ta	um robinsod Imsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocau Ptilotus Rhagodi Rhyncho Santalun Senna ve Stylobas Tephros	nii and n ok grassl orea us aurar ra mono m didym lium tabu hus mad oaea long ulon serr obovatus a erema osia mini n lanceo enusta ium spat ia densa	nixed specie and and Tra- ntiacus phylla um subsp. h ulatum leraspatenss giflora vulatum s subsp. obd ea ma latum thulatum	es low open <i>iodia wiseana</i> ope lineare is
0	Acacia ma shrubland hummock Abutilon a Acacia in Acacia in Acacia tu *Bidens b Boerhavi Bulbostyl Cleome v Corchoru Crotalari Cucumis Dodonaea Dysphani Eriachne Evolvulus Gomphre	onticola tall o l over Themed a grassland. indicum aequilatera onticola mida var. pilb oipinnata ia gardneri is barbata iscosa s incanus sub a medicaginea maderaspatan a viscosa subs a rhadinostac helmsii	pen scrub o la triandra, parensis sp. lithophil a us p. mucronal hya ar. villosical	ver Gossypiu Eriachne hei us ta	um robinsod Imsii tussod Hakea la Hybanth Indigofe Jasminu Paspalia Phyllant Polycarp Pterocau Ptilotus Rhagodi Rhyncho Santalun Senna ve Stylobas Tephros Themeda	nii and n ck grassl orea us aurar ra mono m didym dium tabu hus mad oaea long ulon serr obovatus a eremata sia mini n lanceo enusta ium spat ia densa a triandr	nixed specie and and Tra ntiacus phylla um subsp. h ulatum leraspatenss giflora ulatum s subsp. obd ea ma latum thulatum	es low open <i>iodia wiseana</i> ope lineare is



Botanist	Level 2 Flora an Linda Dat	e 3/29/2012	2 5	lite area	Quadrat 5	0 x 50 m
Location	50K	692155 n		475996 mN	Elevation	
Topography and Geology	Landform: Gentl Aspect and Slope Soil: red clay.	e undulating count 210° gentle (5%) ver of BIF 5-30 c	ry between bre).			,20
Veg Condition	2	Disturbances	none	Land	System	McKay
Site Photo						
		nhloig suben laug	onhloia Comm	nhia hamarslava	una scattered	low trees over
Vegetation Species		<i>phloia</i> subsp. <i>leuc</i> <i>tera</i> scattered tall	shrubs over Tri		riodia brizoi	



Botanist	Linda	Date	3/29/2012	Site area		Quadrat 5	50 x 50 m
Location	50K		691198 mE	7477353	mN	Elevation	
Topography and Geology	Landform Soil: red		BIF 2-10 cm.				
Veg Condition	3 E	Disturbances	cattle grazing, tra vegetation, weed nutrification (dur	s,	Land Sy	ystem	McKay
Site Photo							
Vegetation	over Eren hilliana, S	nophila longifa Senna spp., Ind	alyptus ?xerothermica olia, Eremophila fras digofera monophylla nd	<i>eri</i> subsp. <i>fras</i>	<i>eri</i> open	shrubland	over Acacia
Vegetation Species	over Eren hilliana, S open hum	nophila longif	olia, Eremophila fras digofera monophylla	<i>eri</i> subsp. <i>fras</i> low open shru	<i>seri</i> open bland ov	shrubland er <i>Triodia</i>	over Acacia
	over Eren hilliana, S open hum	nophila longif Senna spp., Ind mock grasslar otocarpum	olia, Eremophila fras digofera monophylla	<i>eri</i> subsp. <i>fras</i> low open shru	seri open bland ov	shrubland er <i>Triodia</i>	over Acacia wiseana very
	over Eren hilliana, S open hum Abutilon o Acacia ap Acacia in	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphre Hibiscus Indigofer	seri open bland ov ena canes burtonii ra monop	shrubland er <i>Triodia</i> scens subs	over Acacia wiseana very p. canescens
	over Eren hilliana, S open hum Abutilon o Acacia ap Acacia in Acacia pr	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera uinocarpa	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminui	seri open bland ov ena canes burtonii ra monop n didymu	shrubland er <i>Triodia</i> scens subs	over Acacia wiseana very p. canescens
	over Eren hilliana, S open hum Abutilon Acacia ap Acacia in Acacia pr Aristida c	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vuinocarpa contorta	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminun Perotis r	seri open bland ov ena canes burtonii ra monop n didymu ara	shrubland er <i>Triodia</i> scens subs hylla um subsp. i	over Acacia wiseana very p. canescens
	over Eren hilliana, S open hum Abutilon o Acacia ap Acacia in Acacia pr Aristida c Aristida c	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vinocarpa contorta contorta	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac	shrubland er <i>Triodia</i> scens subs hylla um subsp. i cea	over Acacia wiseana very p. canescens lineare
	over Eren hilliana, 2 open hum Abutilon Acacia ap Acacia in Acacia pr Aristida c Boerhavia	nophila longif Senna spp., Ind mock grasslan otocarpum otaneura aequilatera vinocarpa contorta contorta a gardneri	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphra Hibiscus Indigofer Jasminun Perotis r *Portula Ptilotus o	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus	shrubland er <i>Triodia</i> scens subs hylla um subsp. i	over Acacia wiseana very p. canescens lineare
	over Eren hilliana, 2 open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Boerhavia Capparis	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vuinocarpa contorta contorta a gardneri lasiantha	olia, Eremophila fras digofera monophylla	eri subsp. fras low open shru Gomphra Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola d	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus uustralis	shrubland er <i>Triodia</i> scens subs hylla um subsp. h sea subsp. obo	over Acacia wiseana very p. canescens lineare ovatus
	over Eren hilliana, 2 open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Boerhavia Capparis Cleome v	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vuinocarpa contorta a gardneri lasiantha iscosa	olia, Eremophila fras digofera monophylla nd	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar	teri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus tustralis temisioia	shrubland er <i>Triodia</i> scens subs hylla um subsp. i cea subsp. obo	over Acacia wiseana very p. canescens lineare ovatus helmsii
	over Eren hilliana, S open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Boerhavia Capparis Cleome v Cymbopo	nophila longifa Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vuinocarpa contorta a gardneri lasiantha iscosa gon ambiguus	olia, Eremophila fras digofera monophylla nd	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus iustralis temisioia temisioia	shrubland er <i>Triodia</i> scens subs hylla um subsp. i cea subsp. obd les subsp.	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, S open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Aristida c Boerhavia Capparis Cleome v Cymbopo Dysphani	nophila longif Senna spp., Ind imock grasslar otocarpum otaneura aequilatera vuinocarpa ontorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac	olia, Eremophila fras digofera monophylla nd hya	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna gl	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus sustralis temisioia temisioia utinosa s	shrubland er <i>Triodia</i> scens subs hylla um subsp. i cea subsp. obo	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, S open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida of Aristida of Boerhavia Capparis Cleome v Cymbopo Dysphani Enneapog	nophila longif Senna spp., Ind imock grasslar otocarpum otaneura aequilatera cuinocarpa contorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac gon caerulesce	olia, Eremophila fras digofera monophylla nd hya ens	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna gl Senna no	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus iustralis temisioia temisioia utinosa s otabilis	shrubland er <i>Triodia</i> scens subs hylla um subsp. i cea subsp. obd les subsp.	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, 2 open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida of Aristida of Boerhavia Capparis Cleome v Cymbopo Dysphani Enneapog Eremoph	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vinocarpa contorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac gon caerulesce ila fraseri subs	olia, Eremophila fras digofera monophylla nd hya ens	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna gl Senna no Sida arei	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus temisioia temisioia utenosa s otabilis nicola	shrubland er Triodia scens subs hylla um subsp. i cea subsp. obd les subsp. ubsp. gluti	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, 2 open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida of Aristida of Boerhavia Capparis Cleome v Cymbopo Dysphani Enneapog Eremophi Eremophi	nophila longif Senna spp., Ind mock grasslan otocarpum otaneura aequilatera vinocarpa contorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac gon caerulesce ila fraseri subs ila longifolia	olia, Eremophila fras digofera monophylla nd hya ens sp. fraseri	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna a Senna ar Senna ar Senna ar Senna ar Senna ar	eri open bland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus nustralis temisioia utinosa s otabilis nicola lasiophy	shrubland er Triodia scens subsp. hylla um subsp. i eea subsp. obd les subsp. ubsp. gluti llum	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, S open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Boerhavia Capparis Cleome v Cymbopo Dysphani Enneapog Eremophi Eucalypti	nophila longif Senna spp., Ind mock grasslar otocarpum otaneura aequilatera vuinocarpa contorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac gon caerulesce ila fraseri subs ila longifolia us ?xerothermu	olia, Eremophila fras digofera monophylla nd hya ens sp. fraseri ica	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminun Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna ar Senna ac Sida aren Solanum Sporobol	eri open ibland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus tustralis temisioia utinosa s otabilis nicola lasiophy lus austro	shrubland er Triodia scens subsp. hylla um subsp. i eea subsp. obd les subsp. ubsp. gluti llum	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla
	over Eren hilliana, S open hum Abutilon of Acacia ap Acacia in Acacia pr Aristida c Aristida c Boerhavia Capparis Cleome v Cymbopo Dysphani Enneapog Eremophi Eucalyptu Euphorbi	nophila longif Senna spp., Ind mock grasslan otocarpum otaneura aequilatera vinocarpa contorta a gardneri lasiantha iscosa gon ambiguus a rhadinostac gon caerulesce ila fraseri subs ila longifolia	olia, Eremophila fras digofera monophylla nd hya ens sp. fraseri ica sp. filiformis	eri subsp. fras low open shru Gomphre Hibiscus Indigofer Jasminur Perotis r *Portula Ptilotus o Salsola a Senna ar Senna ar Senna a Senna ar Senna ar Senna ar Senna ar Senna ar	eri open ibland ov ena canes burtonii ra monop n didymu ara ca olerac obovatus tustralis temisioia utinosa s otabilis nicola lasiophy lus austro	shrubland er Triodia scens subsp. hylla um subsp. i eea subsp. obd les subsp. ubsp. gluti llum	over Acacia wiseana very p. canescens lineare ovatus helmsii oligophylla



Botanist	Level 2 Flo	Date	3/29/201		Site area		Quadrat 5	0 x 50 m
	50K	Date	691671 r		7475755		Elevation	
Location Topography and Geology	Landform: Soil: red cl		1		1473733		Elevation	721 111
Veg Condition	4		urbances	exploratio diggings, tracks		Land	System	МсКау
Site Photo								
Vegetation	Acacia apt helmsii, Er and tussoc		villea stenol sseri subsp.	<i>botrya</i> low o <i>fraseri</i> open	open woodl 1 shrubland	and <i>Senr</i> over mi	na artemision xed species s	<i>ides</i> subsp. scattered herbs
Species	Abutilon o Acacia apt Acacia apt Acacia mir	aneura			Greville Hakea le	orea	<i>otrya</i> 111 otrya 111 otrya	



		_	Ť	Survey - S				
Botanist	Linda	Date	3/29/2012		Site area		Quadrat 5	
Location	50K		690473 n	nE	7477077	mN	Elevation	n 704 m
Topography and Geology	Soil: red c	: Flat plain elay. 90% cover og	f BIF 2-5 cr	n.				
Veg Condition	3	Dist	urbances	cattle graz tracks, nut		Land S	System	McKay
Site Photo								
			WR AL					, , , , , , , , , , , , , , , , , , ,
Vegetation	mixed spe		tered shrubs					all shrubs over c grassland and
Vegetation Species	mixed spe mixed spe <i>Abutilon c</i>	ecies low scat ecies very ope ptocarpum	tered shrubs		ia wiseana Gomphr	very ope	en hummocl	
_	mixed spe mixed spe <i>Abutilon c</i> <i>Acacia an</i>	ccies low scat ccies very ope <i>tocarpum</i> <i>cistrocarpa</i>	tered shrubs		ia wiseana Gomphr Gooden	very ope	en hummocl ninghamii ptera	c grassland and
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap	cies low scat cies very ope otocarpum cistrocarpa taneura	tered shrubs		ia wiseana Gomphr Gooden Jasminu	very ope rena cuni ia microj m didym	en hummocl	c grassland and
_	mixed spe mixed spe Abutilon c Acacia an Acacia ap Acacia pr	ccies low scat ccies very ope otocarpum cistrocarpa taneura uinocarpa	tered shrubs		ia wiseana Gomphr Gooden Jasminu Perotis i	very ope rena cuni ia microj m didym rara	en hummocl ninghamii otera sum subsp. l	c grassland and
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap	cies low scat cies very ope otocarpum cistrocarpa taneura uinocarpa ontorta	tered shrubs		ia wiseana Gomphr Gooden Jasminu Perotis Psydrax	very ope rena cuni ia microj m didym	en hummocl ninghamii otera sum subsp. <i>l</i>	c grassland and
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pro- Aristida co	ccies low scat ccies very ope otocarpum ccistrocarpa taneura uinocarpa ontorta a gardneri	tered shrubs		ia wiseana Gomphr Gooden Jasminu Perotis a Psydrax Pteroca	very ope rena cunn ia microj m didym rara rigidula	en hummool ninghamii ptera num subsp. l num subsp. l	c grassland and
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida co Boerhavia Cleome vi	ccies low scat ccies very ope otocarpum ccistrocarpa taneura uinocarpa ontorta a gardneri	tered shrubs		ia wiseana Gomphr Gooden Jasminu Perotis i Psydrax Pteroca Ptilotus	very ope ena cum ia micro m didym rara rigidula ulon serr heliptere	en hummool ninghamii ptera num subsp. l num subsp. l	k grassland and
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida co Boerhavia Cleome vi Corymbia	cies low scat cies very ope otocarpum cistrocarpa taneura uinocarpa ontorta a gardneri iscosa	tered shrubs		ia wiseana Gomphr Gooden Jasminu Perotis i Psydrax Pteroca Ptilotus Ptilotus	very ope ena cum ia micro m didym rara rigidula ulon serr heliptere obovatu.	en hummocl ninghamii ptera sum subsp. l sum subsp. l sum subsp. l sum subsp. l	c grassland and ineare watus
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida co Boerhavia Cleome vi Corymbia Cymbopog	cies low scat becies very ope otocarpum cistrocarpa taneura uinocarpa ontorta gardneri scosa deserticola	tered shrubs en herbland.	over Triod.	ia wiseana Gomphr Gooden Jasminu Perotis Psydrax Pteroca Ptilotus Ptilotus Senna a Senna g	very ope rena cuni ia microp m didym rara rigidula ulon serri heliptere obovatu. rtemisioi lutinosa	en hummocl ninghamii otera sum subsp. l culatum oides s subsp. obc	c grassland and ineare watus helmsii
_	mixed spe mixed spe Abutilon o Acacia an Acacia ap Acacia pr Aristida co Boerhavia Cleome vi Corymbia Cymbopog Dodonaea	cies low scat becies very ope otocarpum cistrocarpa taneura uinocarpa ontorta a gardneri scosa deserticola gon obtectus	tered shrubs en herbland. sp. <i>mucrona</i> .	over Triod.	ia wiseana Gomphr Gooden Jasminu Perotis Psydrax Pteroca Ptilotus Ptilotus Senna a	very ope rena cuni ia microp m didym rara rigidula ulon serri heliptere obovatu. rtemisioi lutinosa	en hummocl ninghamii otera sum subsp. l culatum oides s subsp. obc ides subsp. l	c grassland and ineare watus helmsii
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida cu Boerhavia Cleome vi Corymbia Cymbopog Dodonaea Dysphania Enneapog	cies low scat cies very ope tocarpum cistrocarpa taneura uinocarpa ontorta a gardneri scosa deserticola gon obtectus a viscosa subs a rhadinostac con caerulesc	tered shrubs en herbland. sp. mucronal chya ens	over Triod.	ia wiseana Gomphr Gooden Jasminu Perotis Psydrax Pteroca Ptilotus Ptilotus Senna a Senna g Senna n Solanun	very ope rena cum ia microp m didym rara rigidula ulon serr heliptere obovatu. rtemision lutinosa otabilis 1 lasioph	en hummool ninghamii otera sum subsp. l rulatum oides s subsp. oba ides subsp. l subsp. gluti yllum	c grassland and ineare watus helmsii
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida cu Boerhavia Cleome vi Corymbia Cymbopog Dodonaea Dysphania Enneapog Eremophi	cies low scat cies very ope tocarpum cistrocarpa taneura uinocarpa ontorta gardneri scosa deserticola gon obtectus viscosa subs a rhadinostac con caerulesc la fraseri sub	tered shrubs en herbland. sp. mucronal chya ens sp. fraseri	over Triod.	ia wiseana Gomphr Gooden Jasminu Perotis i Psydrax Pteroca Ptilotus Ptilotus Senna a Senna g Senna n Solanun Sporobo	very ope rena cum ia microj m didym rara rigidula ulon serr heliptera obovatu, rtemision lutinosa otabilis i lasioph olus austi	en hummool ninghamii otera sum subsp. l rulatum oides s subsp. obo ides subsp. l subsp. gluti yllum ralasicus	c grassland and ineare watus helmsii
_	mixed spe mixed spe Abutilon of Acacia an Acacia ap Acacia pr Aristida cu Boerhavia Cleome vi Corymbia Cymbopog Dodonaea Dysphania Enneapog Eremophi Euphorbia	cies low scat cies very ope tocarpum cistrocarpa taneura uinocarpa ontorta a gardneri scosa deserticola gon obtectus a viscosa subs a rhadinostac con caerulesc	sp. mucronal chya ens sp. fraseri osp. fraseri	over Triod ta	ia wiseana Gomphr Gooden Jasminu Perotis i Psydrax Pteroca Ptilotus Ptilotus Senna a Senna g Senna n Solanun Sporobo	very ope ena cum ia micro m didym rara rigidula ulon serr heliptere obovatu, rtemision lutinosa otabilis tasioph lus austri hirsutus	en hummool ninghamii otera sum subsp. l rulatum oides s subsp. obo ides subsp. l subsp. gluti yllum ralasicus	c grassland and ineare watus helmsii



Lamb Creek	Level 2 Flo	ra and Ve	getation	Survey - S	Site LCF	20		
Botanist	Linda	Date	3/29/201	2	Site area	1	Quadrat 5	50 x 50 m
Location	50K		690589 n	nE	7476396	mN	Elevation	n 707 m
Topography and Geology	Landform: Soil: red cla Geology: 10	ıy.	BIF pebble	s and cobble	s.			
Veg Condition	4	Distu	ırbances	cattle and macropods tracks, trar vegetation nutrificatio (dung), we	npled	Land S	System	МсКау
Site Photo								
Vegetation	<i>mucronata,</i> 2345) open open herbla	Senna arten shrubland o nd.	<i>isioides</i> su	bsp. <i>helmsii</i> ,	Sida sp. S ttered hum	Supplejac mock gr	k Station (asses and n	<i>iscosa</i> subsp. Г.S. Henshall nixed species very
Species	Cymbopogo Dodonaea	neura chronicia ntorta gardneri cosa cosa leserticola aderaspatan on ambiguus viscosa subsp	o. mucrona	ta	Jasminu Perotis i *Portula Pteroca Ptilotus Ptilotus Senna a Senna g Senna n Sida ?sp 2345)	m didym rara aca olera ulon serr heliptero obovatu. rtemisioi lutinosa otabilis o. Supple	ulatum pides s subsp. obd des subsp. s subsp. gluth jack Statior	ovatus helmsii
	Dysphania	<i>rhadinostach</i> <i>fraseri</i> subs	hya		Solanun	1 lasioph a viscosc		



Eremophila longifolia	Tribulus hirsutus
Euphorbia latrobei subsp. filiformis Evolvulus alsinoides var. villosicalyx	Triodia wiseana
Evolvalas alsinolaes val. villosicalyx	



Lamb Creek	Level 2 F	lora and V	egetation	Survey -	Site LCF2	1	
Botanist	Chid	Date	3/29/2012	2	Site area	Quadrat	50 x 50 m
Location	50K		689945 n	nE	7475643 n	nN Elevati	on 838 m
Topography and Geology	Aspect an Soil: ligh	n: Slope on si nd Slope: NN t brown sand 95% cover o	W moderately clay.	y inclined.	cobbles, som	e sheet rock.	
Veg Condition	1	Dis	turbances	none		Land System	Boolgeeda
Site Photo							
Vegetation						<i>cophloia</i> scatter na open hummo	ed low trees over ck grassland.
Species	Corchoru Corymbia Cymbopo Dampiera Eriachne Eucalypta	aequilatera us incanus sul a hamersleyan ogon ambiguu a candicans helmsii us leucophloi m robinsonii	na s		Ptilotus co Scaevola Senna art Senna glu	a monophylla alostachyus browniana subs emisioides subsp tinosa subsp. gli phlomoides	. oligophylla



	Chid	Date	3/29/2012	2	Site area	L	Quadrat 5	50 x 50 m
Location	50K		691099 n	nE	7474508	mN	Elevation	n 725 m
Topography and Geology	Soil: oran	: Flat plain ge brown sar 90% cover o		ebbles.				
Veg Condition	2	Dist	urbances	cattle, veh tracks near		Land S	system	McKay
Veg Condition	State of the second sec					-		
Vegetation	xiphophyl grassland.	s gamophylla la tall scatter	ed shrubs ov		orizoides, T		seana oper	



Botanist	Chid Da	ate 3/29/201	2	Site area		Quadrat 5	50 x 50 m
Location	50K	691122	mE	7474279 r	nN	Elevation	n 728 m
Fopography and Geology	-	d creekline wn fine sandy clay over of ironstone j		oles.			
Veg Condition	2	Disturbances	weeds, cat	tle	Land S	ystem	МсКау
Site Photo							
Vegetation	Acacia monticol	rsleyana, Eucalypa a, Acacia pyrifolia very open hummo	a var. morriso	onii, Rulingi			
Species	Acacia elachant Acacia monticol Acacia pyrifolia					nsis subsp. des var. vil	eremophila



Botanist	Linda	Date	3/30/2012	,	Site LCF Site area		Quadrat 5	0 x 50 m
		Date					-	
Location	50K		691209 n		7473395	mN	Elevation	/33 m
Topography and Geology	Aspect an Soil: red c	: Foothills of d Slope: Eas elay. 95% cover o	t 105° mode	rately incline				
Veg Condition	2	Dist	turbances	grazing (ca	ttle)	Land Sy	ystem	Boolgeeda
Site Photo								Firms for
Vegetation	artemision wiseana,	Triodia brizo	ligophylla , S ides hummo	Senna glutino	osa subsp. ;	glutinosa	open shrut	oland over Triodic
Species	Acacia hi Acacia me Bulbostyli Corchoru Eucalyptu Fimbristy	onticola	y subsp. <i>lasio</i> a subsp. <i>leuc</i>		Ptilotus Schizach Senna an Senna gi Solanum Trachym		<i>lius agile les</i> subsp. <i>c</i> ubsp. <i>pruir</i> llum	ligophylla Iosa



Botanist			Ĭ		Site LCF	25	1	
Dotamst		Date	3/30/2012		Site area		-	50 x 50 m
Location	50K		689979 n	ıE	7471899	mN	Elevation	n 757 m
Topography and Geology	Landform: Pla Soil: red clay. Geology: 80%		BIF gravels	and pebble	s.			
Veg Condition	3	Distu	irbances	grazing, fin approxima years prev	tely 3	Land S	System	McKay
Site Photo								
Vegetation	Eucalyptus ga open shrublar							nixed species low


Botanist	Chid	Date	3/30/2012	2	Site LCF Site area		Quadrat 5	50 x 50 m
	50K	Date	689383 m		7472214		Elevation	
Location Topography and Geology	Landform: Aspect and Soil: orang	ge brown cla	ide E moderately	v inclined.			Elevation	1 /03 III
Veg Condition	2	Dis	turbances	none		Land S	ystem	Boolgeeda
Site Photo								
Vegetation			<i>a</i> subsp. <i>leuc</i> red low shrub					d low trees over assland.
-	Acacia hil Acacia ad	<i>liana</i> scatte oxa var. ado	red low shrub			open hu		
-	Acacia hil Acacia ad Acacia hil	<i>liana</i> scatte oxa var. ado liana	red low shrub		dia wiseana Hakea la Hibiscus	open hu prea s sturtii v	mmock gra ar. <i>campyle</i>	assland.
-	Acacia hil Acacia ad Acacia hil Acacia mo	<i>liana</i> scatte oxa var. add liana onticola	red low shrub		dia wiseana Hakea la Hibiscus Polycarp	open hu prea s sturtii v paea holt	mmock gra ar. <i>campyle</i> zei	assland.
-	Acacia hil Acacia ada Acacia hil Acacia mo Acacia ten	liana scatte oxa var. add liana onticola puissima	red low shrub		dia wiseana Hakea la Hibiscus Polycarp Polycarp	open hu prea s sturtii v paea holt paea long	mmock gra ar. <i>campyle</i> zei giflora	assland.
-	Acacia hil Acacia add Acacia hil Acacia mo Acacia ten Aristida ho	liana scatte oxa var. ado liana onticola ouissima olathera	red low shrub		dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus	open hu prea s sturtii v paea holt paea long astrolasi	mmock gra ar. <i>campylo</i> zei giflora us	assland.
-	Acacia hil Acacia ada Acacia hil Acacia mo Acacia ten Aristida hu Bulbostyli	liana scatte oxa var. add liana onticola ouissima olathera s barbata	red low shrub axa	os over Triod	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus	open hu prea s sturtii v paea holt paea long astrolasi calostacl	mmock gra ar. <i>campyle</i> zei giflora us hyus	assland.
-	Acacia hil Acacia ada Acacia hil Acacia mo Acacia ten Aristida ho Bulbostyli Corchorus	liana scatte oxa var. ado liana onticola ouissima olathera s barbata s incanus su	red low shrub txa bsp. lithophil	os over Triod	tia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Ptilotus	open hu prea s sturtii v paea holt paea long astrolasi calostach clementii	mmock gra ar. <i>campyle</i> zei giflora us hyus i	assland.
-	Acacia hil Acacia ad Acacia hil Acacia mo Acacia ten Aristida he Bulbostyli Corchorus Corymbia	liana scatte oxa var. ado liana onticola ouissima olathera s barbata s incanus su hamersleya	red low shrub txa bsp. lithophil	os over Triod	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus	open hu prea s sturtii v paea holt paea long astrolasi calostach clementu rotundifo	mmock gra ar. <i>campyle</i> zei giflora us hyus i olius	assland. ochlamys
-	Acacia hil Acacia ad Acacia hil Acacia mo Acacia ten Aristida he Bulbostyli Corchorus Corymbia Dodonaea	liana scatte oxa var. ado liana onticola ouissima olathera s barbata s incanus su hamersleya o coriacea	red low shrub oxa bsp. lithophil na	os over Triod	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Ptilotus Scaevola	open hu prea s sturtii v paea holt paea long astrolasi calostach clementin rotundifc u browni	mmock gra ar. campylo zei giflora us hyus i blius cana subsp.	assland.
-	Acacia hil Acacia ad Acacia hil Acacia mo Acacia ten Aristida hi Bulbostyli. Corchorus Corymbia Dodonaea Enneapog	liana scatte oxa var. ado liana onticola ouissima olathera s barbata s incanus su hamersleya c coriacea on polyphyl	red low shrub oxa bsp. lithophil na lus	bs over Triod	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Ptilotus Scaevold Schizach	open hu orea s sturtii v paea holt paea long astrolasi calostach clementin rotundifo u browni nyrium fro	mmock gra ar. <i>campylo</i> zei giflora us hyus i olius iana subsp. agile	assland. ochlamys browniana
-	Acacia hil Acacia ad Acacia hil Acacia mo Acacia ten Aristida he Bulbostyli Corchorus Corymbia Dodonaea Enneapog Eremophia	liana scatte oxa var. add liana onticola ouissima olathera s barbata s barbata s incanus su hamersleya c coriacea on polyphyl la forrestii s	red low shrub oxa bsp. lithophil na	bs over Triod	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au	open hu prea s sturtii v paea holt paea long astrolasi calostach clementii rotundifo a browni nyrium fra rtemisioid	mmock gra ar. campylo zei giflora us hyus i olius cana subsp. agile des subsp. o	assland. ochlamys browniana oligophylla
-	Acacia hil Acacia ad Acacia hil Acacia hil Acacia ten Aristida ho Bulbostyli Corchorus Corymbia Dodonaea Enneapog Eremophil Eriachne	liana scatte oxa var. add liana onticola ouissima olathera s barbata s barbata s incanus su hamersleya c coriacea on polyphyl la forrestii s helmsii	red low shrub oxa bsp. lithophil na lus ubsp. forresta	bs over Triod lus	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna gu	open hu prea s sturtii v paea holt paea long astrolasi calostach clementii rotundifo a browni nyrium fri rtemisioid lutinosa s	mmock gra ar. campylo zei giflora us hyus j blius fana subsp. agile des subsp. gluti	assland. ochlamys browniana oligophylla
-	Acacia hil Acacia ad Acacia hil Acacia ma Acacia ten Aristida ha Bulbostyli Corchorus Corymbia Dodonaea Enneapog Eremophi Eriachne f Eriachne f	liana scatte oxa var. add liana onticola ouissima olathera s barbata s incanus su hamersleya c oriacea on polyphyl la forrestii s helmsii oulchella su	red low shrub bxa bsp. lithophil na lus ubsp. forresta bsp. pulchella	bs over Triod lus ii	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna g Sida ?ec	open hu prea s sturtii v paea holt paea long astrolasi calostach clementii rotundifo a browni nyrium fr rtemisioid lutinosa s hinocarp	mmock gra ar. campylo zei giflora us hyus j olius fana subsp. agile des subsp. gluti pa	assland. ochlamys browniana oligophylla inosa
-	Acacia hil Acacia adi Acacia adi Acacia mo Acacia ten Aristida ho Bulbostyli Corchorus Corymbia Dodonaea Enneapog Eremophin Eriachne p Eucalyptu	liana scatte oxa var. add liana onticola onticola olathera s barbata s incanus su hamersleya c coriacea on polyphyl la forrestii s helmsii oulchella su s leucophlo	red low shrub bxa bsp. lithophil na lus ubsp. forresta bsp. pulchella a subsp. leuc	bs over Triod lus ii	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna gu Sida ?ec Sida sp.	open hu prea s sturtii v paea holt paea long astrolasi calostach clementii rotundifo a browni nyrium fr rtemisioid lutinosa s hinocarp	mmock gra ar. campylo zei giflora us hyus j olius fana subsp. agile des subsp. gluti pa	assland. ochlamys browniana oligophylla
Vegetation Species	Acacia hil Acacia ad Acacia ad Acacia ma Acacia ten Aristida ha Bulbostyli Corchorus Corymbia Dodonaea Enneapog Eremophin Eriachne p Eucalyptu Fimbristyl	liana scatte oxa var. add liana onticola onticola olathera s barbata s incanus su hamersleya coriacea on polyphyl la forrestii s helmsii pulchella su s leucophlo is dichotom	red low shrub bxa bsp. lithophil na lus ubsp. forresta bsp. pulchella ia subsp. leuc a	bs over Triod lus ii	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna gu Sida ?ec Sida sp. 32)	open hu prea s sturtii v paea holt paea long astrolasi calostach clementin rotundifo u browni nyrium fru rtemisioid lutinosa s hinocarp Golden c	mmock gra ar. campylo zei giflora us hyus i blius iana subsp. agile des subsp. gluti ba calyces glat	assland. ochlamys browniana oligophylla inosa
-	Acacia hil Acacia ad Acacia ad Acacia hil Acacia mo Acacia ten Aristida hi Bulbostyli. Corchorus Corymbia Dodonaea Enneapog Eremophia Eriachne p Eucalyptu. Fimbristyl Gomphren	liana scatte oxa var. ado liana onticola onticola onticola onticola onticola sincanus su hamersleya coriacea on polyphyl la forrestii s helmsii oulchella su s leucophlo. fis dichotom a cunningh	red low shrub bxa bsp. lithophil na lus ubsp. forresta bsp. pulchella ia subsp. leuc a	bs over Triod lus ii	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna gu Sida ?ec Sida sp. 32)	open hu orea s sturtii v paea holt paea long astrolasi calostach clementin rotundifo u browni nyrium fra rtemisioid lutinosa s hinocarp Golden c	mmock gra ar. campylo zei giflora us hyus i blius iana subsp. agile des subsp. gluti ba calyces glat	assland. ochlamys browniana oligophylla inosa
-	Acacia hil Acacia ad Acacia ad Acacia hil Acacia mo Acacia ten Aristida hi Bulbostyli. Corchorus Corymbia Dodonaea Enneapog Eremophia Eriachne p Eucalyptu. Fimbristyl Gomphren Goodenia	liana scatte oxa var. add liana onticola onticola olathera s barbata s incanus su hamersleya coriacea on polyphyl la forrestii s helmsii pulchella su s leucophlo is dichotom	red low shrub bxa bsp. lithophil na lus ubsp. forresta bsp. pulchella ia subsp. leuc a	bs over Triod lus ii	dia wiseana Hakea la Hibiscus Polycarp Polycarp Ptilotus Ptilotus Ptilotus Scaevola Schizach Senna au Senna gu Sida ?ec Sida sp. 32) Solanum Triodia	open hu orea s sturtii v paea holt paea long astrolasi calostach clementin rotundifo u browni nyrium fra rtemisioid lutinosa s hinocarp Golden c a lasiophy wiseana	mmock gra ar. campylo zei giflora us hyus i blius iana subsp. agile des subsp. gluti ba calyces glat	assland. ochlamys browniana oligophylla inosa brous (H.N. Foote



Deterint	Level 2 F		Ť	•	1		0 1	0 - 50
Botanist	Chid	Date	3/30/201		Site area		Quadrat 5	
Location	50K		688788 n	nE	7472189	mN	Elevation	828 m
Topography and Geology	Aspect: N Soil: pale	n: Stony hills NE. brown fine o 95% cover o	elay.	bebbles, cobb	bles.			
Veg Condition	1	Dis	turbances	none		Land S	System	Boolgeeda
Site Photo								
Vegetation	Keraudre	us leucophloi enia nephrosp						low trees over
Species		k grassland an <i>doxa</i> var. <i>ado</i>	nd Schizachy			tussock	grassland.	ana open



Botanist	Linda	Date	3/30/2012	2	Site area	ı –	Quadrat 5	0 x 50 m
Location	50K		687837 n	nE	7470500	mN	Elevation	777 m
Topography and Geology	Landform: Aspect and Soil: red cl	Shallow wid Slope: S 20 ay. 0% cover of	e drainage 0° gently in	line on plain clined.		I	1	
Veg Condition	3	Dist	urbances	cattle graz	ing,	Land S	System	McKay
Site Photo								
Vegetation	elachantha	, <i>Gossypium</i> ubsp. <i>pruino</i>	robinsonii	tall open shr	ubland ove	er Keraud	drenia nephi	enuissima, Acacia rosperma, Senna wiseana open
Species	Acacia apte Acacia bive Acacia elac Acacia elac	enosa chantha chantha edmanii subs			Hakea la Indigofe Jasminu Keraudr Psydrax	era mono _l um didym renia nep : rigidula calostac	phylla um subsp. li hrosperma	neare



Doton: -+	1		Ĭ		Site LCF		Oread and 1	50 - 50
Botanist	Linda	Date	3/30/2012		Site area		~	50 x 50 m
Location	50K		685400 m	1E	7469780	mN	Elevation	n 754 m
Topography and Geology	Landform: F Soil: red clay Geology: 30	y.	•		-		etween two	breakaways
Veg Condition	3	Distu	ırbances	grazing, er weeds	rosion,	Land S	System	McKay
Site Photo								
Vegetation	Corymbia ha open shrubla eriopoda ven	and over <i>Tri</i>	iodia wisear	a hummocl				ria elachantha tall Eragrostis
	open shrubla eriopoda ven Acacia elach	and over <i>Tri</i> ry open tuss hantha	iodia wisear	a hummocl	k grassland <i>Gossypi</i>	and Eulo	alia aurea, sonii	
	open shrubla eriopoda ven Acacia elach Acacia maita	and over <i>Tri</i> ry open tuss hantha landii	iodia wisear	a hummocl	k grassland Gossypi Hybanth	and Eulo um robin ius aurar	alia aurea, nsonii ntiacus	Eragrostis
	open shrubla eriopoda ven Acacia elach Acacia maiti Alternanthen	and over <i>Tri</i> ry open tuss hantha landii ra nana	iodia wisear	a hummocl	k grassland Gossypi Hybanth Jasminu	and Eulo um robin us aurar m didym	alia aurea, nsonii ntiacus um subsp. i	Eragrostis lineare
_	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con	and over <i>Tri</i> ry open tuss hantha landii ra nana torta	iodia wisear	a hummocl	k grassland Gossypi Hybanth Jasminu Keraudi	and Eulo um robin us aurar m didym cenia nep	alia aurea, nsonii ntiacus	Eragrostis lineare
_	open shrubla eriopoda ven Acacia elach Acacia maita Alternanther Aristida con Boerhavia g	and over <i>Tri</i> ry open tuss hantha landii ra nana torta tardneri	iodia wisear	a hummocl	k grassland Gossypi Hybanth Jasminu Keraudh Perotis	and Eulo um robin nus aurar m didym renia nep rara	alia aurea, asonii ntiacus um subsp. i hrosperma	Eragrostis lineare
_	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco	and over <i>Tri</i> ry open tuss hantha landii ra nana torta gardneri osa	iodia wisean ock grassla	a hummocl	k grassland Gossypi Hybanth Jasminu Keraudh Perotis Pteroca	and Eula um robin nus aurar m didym renia nep rara ulon serr	alia aurea, asonii ntiacus um subsp. i hrosperma rulatum	Eragrostis lineare
_	open shrubla eriopoda ven Acacia elach Acacia mait Alternanthen Aristida con Boerhavia g Cleome visc Corymbia ?	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyai	iodia wisean ock grassla	a hummocl	k grassland Gossypi Hybantl Jasminu Keraudr Perotis Pteroca Rhyncho	and Eula um robin nus aurar m didym renia nep rara ulon serr osia mini	alia aurea, usonii ntiacus um subsp. i hrosperma rulatum ma	Eragrostis lineare
	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ?i Cymbopogo	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyan n ambiguus	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybantl Jasminu Keraudi Perotis Pteroca Rhyncho Rulingic	and Eula um robin nus aurar m didym renia nep rara ulon serr osia mini a luteiflor	alia aurea, nsonii ntiacus um subsp. i whrosperma rulatum ma ra	Eragrostis lineare
	open shrubla eriopoda ven Acacia elach Acacia mait Alternanthen Aristida con Boerhavia g Cleome visc Corymbia ?	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyan n ambiguus	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybantl Jasminu Keraudi Perotis Pteroca Rhyncho Rulingic	and Eula um robin nus aurar m didym renia nep rara ulon serr osia mini	alia aurea, nsonii ntiacus um subsp. i whrosperma rulatum ma ra	Eragrostis lineare
	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ?i Cymbopogo	and over Tri ry open tuss hantha landii ra nana torta tardneri osa hamersleyar n ambiguus hadinostach	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybanth Jasminu Keraudh Perotis Pteroca Rhyncho Rulingio Rulingio	and Eula um robin nus aurar m didym renia nep rara ulon serr osia mini a luteiflor	alia aurea, nsonii ntiacus um subsp. i whrosperma rulatum ma ra ra	Eragrostis lineare
	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ? Cymbopogo Dysphania r	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyan n ambiguus rhadinostacl eriopoda	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybanth Jasminu Keraudh Perotis Pteroca Rhyncho Rulingio Santalun	and Eula um robin nus aurar um didym renia nep rara ulon serr osia mini ulon serr osia mini ulon serr osia mini ulon serr osia mini ulon serr n lanceo	alia aurea, nsonii ntiacus um subsp. i whrosperma rulatum ma ra ra	Eragrostis lineare
_	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ? Cymbopogo Dysphania r Eragrostis e	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyar n ambiguus rhadinostach riopoda gamophylla	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybantl Jasminu Keraudr Perotis Pteroca Rhyncho Rulingio Santalur Scaevolo	and Eula um robin nus aurar um didym renia nep rara ulon serr osia mini a luteiflor a luteiflor n lanceo a parvifo	alia aurea, nsonii ntiacus um subsp. i phrosperma rulatum ra ra latum lia subsp. p	Eragrostis lineare pilbarae
_	open shrubla eriopoda ven Acacia elach Acacia maita Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ?l Cymbopogo Dysphania r Eragrostis e Eucalyptus g	and over Tri ry open tuss hantha landii ra nana torta ardneri osa hamersleyan n ambiguus chadinostach eriopoda gamophylla ea	iodia wisean ock grasslar na	a hummocl	k grassland Gossypi Hybant Jasminu Keraudn Perotis Pteroca Rhyncho Rulingic Santalun Scaevolo Senna a	and Eula um robin nus aurar um didym renia nep rara ulon serr osia mini u luteiflor a luteiflor n lanceo a parvifo rtemisioi	alia aurea, usonii ntiacus um subsp. i phrosperma rulatum ma ra latum lia subsp. p des subsp. p	Eragrostis lineare
Vegetation Species	open shrubla eriopoda ven Acacia elach Acacia mait. Alternanther Aristida con Boerhavia g Cleome visc. Corymbia ?I Cymbopogo. Dysphania r Eragrostis e Eucalyptus g Eulalia aure Euphorbia b	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyar n ambiguus rhadinostach eriopoda gamophylla ea biconvexa	iodia wisean ock grasslan na hya	<i>a</i> hummoch nd.	k grassland Gossypi Hybanth Jasminu Keraudh Perotis Pteroca Rhyncha Rulingia Santalun Scaevola Senna a Tephros	and Eula um robin nus aurar um didym renia nep rara ulon serr osia mini a luteiflor a luteiflor n lanceo a parvifo	alia aurea, usonii ntiacus um subsp. h ohrosperma rulatum ma ra latum lia subsp. p des subsp. d	Eragrostis lineare pilbarae
_	open shrubla eriopoda ven Acacia elach Acacia mait, Alternanthen Aristida con Boerhavia g Cleome visco Corymbia ?I Cymbopogo Dysphania r Eragrostis e Eucalyptus g Eulalia aure Euphorbia b Evolvulus al	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyan n ambiguus chadinostach riopoda gamophylla ea biconvexa lsinoides van	iodia wisean ock grasslar na hya r. villosicaly	<i>a</i> hummoch nd. x	k grassland Gossypi Hybanth Jasminu Keraudh Perotis H Pteroca Rhyncho Rulingio Santalun Scaevolo Senna a Tephros Tribulus	and Eula um robin nus aurar om didym renia nep rara ulon serr osia mini a luteiflor a luteiflor n lanceo a parvifo rtemisioi ia densa	alia aurea, usonii ntiacus um subsp. h ohrosperma rulatum ma ra latum lia subsp. p des subsp. d	Eragrostis lineare pilbarae
_	open shrubla eriopoda ven Acacia elach Acacia mait. Alternanther Aristida con Boerhavia g Cleome visc. Corymbia ?I Cymbopogo. Dysphania r Eragrostis e Eucalyptus g Eulalia aure Euphorbia b	and over Tri ry open tuss hantha landii ra nana torta gardneri osa hamersleyan n ambiguus chadinostach riopoda gamophylla ea biconvexa lsinoides van canescens s	iodia wisean ock grasslan na hya r. villosicaly subsp. canes	<i>a</i> hummoch nd. x	k grassland Gossypi Hybanth Jasminu Keraudh Perotis H Pteroca Rhyncho Rulingia Santalun Scaevola Senna a Tephros Tribulus Triodia	and Eula um robin nus aurar em didym renia nep rara ulon serr osia mini a luteiflor a luteiflor a luteiflor n lanceo a parvifo rtemisioi ia densa s hirsutus wiseana	alia aurea, usonii ntiacus um subsp. h ohrosperma rulatum ma ra latum lia subsp. p des subsp. d	Eragrostis lineare pilbarae oligophylla



Botanist	Chid	Date	3/30/2012	Site a	rea	Quadrat 5	0 x 50 m
Location	50K	Dutt	685189 mE		360 mN	Elevation	
		n [.] Stony hillside		dges and breaka		Elevation	/01 111
Topography and Geology	Aspect ar Soil: red	nd Slope: NW r brown sandy cl 90% cover of	noderately incl ay.	ined.	iways		
Veg Condition	0	Distu	rbances ?		Land	System	McKay
Site Photo							
Vegetation	scattered		riodia wiseana	<i>loia</i> scattered lo hummock grass			
Vegetation	scattered scattered Acacia di	shrubs over <i>Tr</i> tussock grasses ictyophleba	riodia wiseana	hummock grass		Cymbopogon d	
	scattered scattered Acacia di Acacia in	shrubs over Tr tussock grasses ictyophleba aequilatera	riodia wiseana	hummock grass	sland and C denia muel denia stobl	Cymbopogon d Ieriana osiana	
	scattered scattered Acacia di Acacia in Aristida h	shrubs over Tr tussock grasses ictyophleba paequilatera holathera	riodia wiseana	hummock grass	sland and C denia muel denia stobl typium rob	Cymbopogon d Ieriana osiana	
	scattered scattered Acacia di Acacia in Aristida I Boerhavi	shrubs over Tr tussock grasses ictyophleba haequilatera holathera a gardneri	riodia wiseana	hummock grass Good Good Goss Hake	sland and C denia muel denia stobl ypium rob za lorea	Cymbopogon d Ieriana osiana insonii	
	scattered scattered Acacia di Acacia in Aristida H Boerhavii Bulbostyl	shrubs over Tr tussock grasses ictyophleba haequilatera holathera a gardneri lis barbata	riodia wiseana 5.	hummock grass Good Goos Hake Para	sland and C denia muel denia stobl gpium rob ea lorea uneurachne	Cymbopogon d Ieriana osiana insonii 2 muelleri	
	scattered scattered Acacia di Acacia in Aristida h Boerhavi Bulbostyl Corchoru	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs	riodia wiseana 5.	hummock grass Good Good Goss Hake Para Poly	denia muel denia stobl denia stobl typium rob ea lorea uneurachne carpaea ho	Cymbopogon o leriana bsiana insonii e muelleri oltzei	ambiguus
	scattered scattered Acacia di Acacia in Aristida l Boerhavi Bulbostyl Corchoru Corymbia	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola	riodia wiseana s. p. lithophilus	hummock grass Good Good Hake Para Poly Ptilo	denia muel denia stobl denia stobl gpium rob ea lorea uneurachne carpaea ho tus obovat	Cymbopogon o Ieriana bsiana insonii e muelleri oltzei us subsp. obo	ambiguus
	scattered scattered Acacia di Acacia in Aristida l Boerhavi Bulbostyl Corchoru Corymbia	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs	riodia wiseana s. p. lithophilus	hummock grass Good Good Hake Para Poly Ptilo	denia muel denia stobl denia stobl typium rob ea lorea uneurachne carpaea ho	Cymbopogon o Ieriana bsiana insonii e muelleri oltzei us subsp. obo	ambiguus
	scattered scattered Acacia di Acacia in Aristida H Boerhavi Bulbostyl Corchoru Corymbia Corymbia	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola	riodia wiseana s. p. lithophilus	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo	denia muel denia stobl denia stobl gpium rob ea lorea uneurachne carpaea ho tus obovat	Cymbopogon o Ieriana bsiana insonii e muelleri oltzei us subsp. obo ifolius	ambiguus
	scattered scattered Acacia di Acacia in Aristida I Boerhavi Bulbostyl Corchoru Corymbia Corymbia Cucumis	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana	riodia wiseana s. p. lithophilus	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Rhym	sland and C denia muel denia stobl gypium rob ea lorea meurachne carpaea ho tus obovat tus rotund	Cymbopogon o leriana bsiana insonii muelleri bltzei us subsp. obo ifolius folius	ambiguus
	scattered scattered Acacia du Acacia in Aristida H Boerhavi Bulbostyl Corchoru Corymbia Cucumis Cymbopo	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana maderaspatani	riodia wiseana s. p. lithophilus u us	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Rhyn Rhyn	sland and C denia muel denia stobl gypium rob ea lorea uneurachne carpaea ho tus obovat tus rotund acharrhena	Cymbopogon o leriana bsiana insonii muelleri oltzei us subsp. obo ifolius ifolius ilinearis nima	ambiguus
	scattered scattered Acacia du Acacia in Aristida H Boerhavi Bulbostyl Corchoru Corymbia Cucumis Cymbopo	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana maderaspatam ogon ambiguus ila forrestii sub	riodia wiseana s. p. lithophilus u us	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Rhyn Rhyn Schiz	sland and C denia muel denia stobl gypium rob ea lorea meurachne carpaea ho tus obovat tus rotund acharrhena achosia min zachyrium	Cymbopogon o leriana bsiana insonii muelleri oltzei us subsp. obo ifolius ifolius ilinearis nima	ambiguus watus
	scattered scattered Acacia di Acacia in Aristida H Boerhavi Bulbostyl Corchoru Corymbia Corymbia Cucumis Cymbopo Eremoph Eriachne	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana maderaspatam ogon ambiguus ila forrestii sub	riodia wiseana s. p. lithophilus u ssp. forrestii	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Rhyn Rhyn Schiz Senn	sland and C denia muel denia stobl gypium rob ea lorea meurachne carpaea ho tus obovat tus rotund acharrhena achosia min zachyrium	Cymbopogon o Ieriana osiana insonii e muelleri oltzei us subsp. obo ifolius e linearis nima fragile a subsp. glutin	ambiguus watus
	scattered scattered Acacia di Acacia in Aristida l Boerhavi Bulbostyl Corchoru Corymbia Corymbia Cucumis Cymbopo Eremoph Eriachne Eriachne	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana maderaspatam ogon ambiguus ila forrestii sub helmsii	riodia wiseana s. p. lithophilus us psp. forrestii p. pulchella	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Rhym Rhym Schiz Senn Sida	sland and C denia muel denia stobl gpium robl ea lorea aneurachne carpaea ho tus obovat tus rotund acharrhena achosia min zachyrium a glutinoso	Cymbopogon o Ieriana insonii e muelleri oltzei us subsp. obo ifolius e linearis nima fragile a subsp. glutin rpa	ambiguus watus
	scattered scattered Acacia di Acacia in Aristida l Boerhavi Bulbostyl Corchoru Corymbia Corymbia Cucumis Cymbopo Eremoph Eriachne Eriachne	shrubs over Tr tussock grasses ictyophleba aequilatera holathera a gardneri lis barbata us incanus subs a deserticola a hamersleyana maderaspatani ogon ambiguus ila forrestii sub helmsii pulchella subs us leucophloia	riodia wiseana s. p. lithophilus us psp. forrestii p. pulchella	hummock grass Good Good Goss Hake Para Poly Ptilo Ptilo Ptilo Rhym Schiz Senn Sida Then	sland and C denia muel denia stobl gypium robl ea lorea meurachne carpaea ho tus obovat tus rotund acharrhena achosia min zachyrium a glutinoso ?echinoca	Cymbopogon o Ieriana isiana insonii e muelleri oltzei us subsp. obo ifolius ifolius e linearis nima fragile a subsp. glutin rpa Ira	ambiguus watus



Botanist	Chid	Date	3/30/201	2	Site LCF		Quadrat 5	$50 \times 50 m$
		Date					-	
Location	50K		684925 n	nE	7469255	mN	Elevation	n /46 m
Topography and Geology	Soil: red sa			e area gravel, pebble	es.			
Veg Condition	3	Dist	turbances	weeds, cat	tle	Land S	System	McKay
Site Photo								
Vegetation	Dactylocte		ins open tuss	and over <i>The</i> sock grasslan				<i>idis,</i> subsp. <i>obliqua,</i>
Vegetation Species	Dactylocte	enium radula estralis open	ins open tuss		nd with <i>Nic</i>	otiana o		subsp. <i>obliqua</i> ,
	Dactylocte Salsola au	enium radula estralis open pinnata	ins open tuss		nd with Nic Evolvulu Goodeni	otiana o us alsino ia forresi	ccidentalis ides var. vil	subsp. <i>obliqua</i> ,
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr	enium radula estralis open pinnata rgata um american	uns open tuss herbland.		nd with Nic Evolvulu Goodeni Hakea lo	otiana o us alsino ia forrest orea	ccidentalis ides var. vil tii	subsp. <i>obliqua</i> ,
	Dactylocte Salsola au Bidens bip Chloris vii *Malvastr *Portulaco	enium radula estralis open vinnata rgata um americar a oleracea	uns open tuss herbland.		nd with Nic Evolvulu Goodeni Hakea la Ipomoea	otiana o us alsino ia forrest orea u polymo	ccidentalis ides var. vil tii rpha	subsp. <i>obliqua</i> ,
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o	enium radula estralis open pinnata rgata um americar a oleracea tocarpum	uns open tuss herbland.		nd with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema	otiana o us alsinos ia forrest orea u polymo membra	ccidentalis ides var. vil tii rpha unaceum	subsp. <i>obliqua,</i>
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu	enium radula estralis open vinnata rgata um americar a oleracea tocarpum taneura	uns open tuss herbland.		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian	otiana o us alsinos ia forrest orea u polymo membra a occide	ccidentalis ides var. vil tii rpha unaceum ntalis subsj	subsp. <i>obliqua,</i>
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu Acacia pru	enium radula estralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia	otiana o us alsinou ia forrest prea u polymo membra va occide lium rart	ccidentalis ides var. vil tii rpha unaceum ntalis subsj um	subsp. <i>obliqua,</i>
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu Acacia pru Aristida co	enium radula estralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. o	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pteroca	otiana o us alsino ia forrest orea polymo membra a occide lium rart ulon serr	ccidentalis ides var. vil tii rpha unaceum ntalis subsj um ulatum	subsp. <i>obliqua,</i>
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu Acacia pru Aristida ce Aristida he	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. o olathera	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus	otiana o us alsinos ia forrest orea u polymo membra a occide dium raru ulon serr helipterc	ccidentalis ides var. vil tii rpha unaceum ntalis subsj un ulatum vides	subsp. <i>obliqua,</i>
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu Acacia pru Aristida co Aristida ho Aristida la	enium radula stralis open pinnata rgata um americar a oleracea tocarpum taneura uinocarpa uinocarpa ulycina var. o olathera uzaridis	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus	otiana o ls alsino a forrest orea polymo membra a occide dium rart ulon serr helipterc macroce	ccidentalis ides var. vil tii rpha unaceum ntalis subsj un ulatum pides phalus	subsp. <i>obliqua</i> , <i>llosicalyx</i> p. <i>obliqua</i>
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Aristida la Boerhavia	enium radula stralis open innata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera tzaridis gardneri	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Ptilotus	otiana o la alsino da forrest orea u polymo membra da occide lium rart ulon serr helipterc macroce obovatus	ccidentalis ides var. vil tii rpha unaceum ntalis subsp un ulatum pides phalus s subsp. obo	subsp. <i>obliqua</i> , <i>llosicalyx</i> p. <i>obliqua</i>
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ho Aristida la Boerhavia Capparis h	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera vzaridis gardneri lasiantha	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Ptilotus Rhagodi	otiana o ls alsino a forrest orea a polymo membra a occide lium rart ulon serr helipterc macroce obovatus a erema	ccidentalis ides var. vil tii rpha unaceum ntalis subsp un ulatum pides phalus s subsp. obo	subsp. <i>obliqua</i> , <i>llosicalyx</i> p. <i>obliqua</i>
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Boerhavia Capparis l Chrysopog	enium radula stralis open vinnata rgata um american a oleracea tocarpum taneura uinocarpa uinocarpa ulycina var. a olathera szaridis gardneri lasiantha gon fallax	ns open tuss herbland. num		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola d	otiana o us alsino a forrest orea u polymo membra a occide lium rart ulon serr heliptero macroce obovatus a erema australis	ccidentalis ides var. vil iii rpha inaceum ntalis subsp ulatum pides phalus s subsp. obc ea	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr. *Portulace Abutilon o Acacia apu Acacia pru Aristida co Aristida ho Aristida la Boerhavia Capparis l Chrysopog Cleome vis	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. a olathera szaridis gardneri lasiantha gon fallax sscosa	herbland. hum calycina		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi	otiana o us alsinoi ia forrest orea u polymo membra a occide lium rart ulon serr helipterc macroce obovatus a erema australis lutinosa	ccidentalis ides var. vil tii rpha unaceum ntalis subsj um ulatum pides phalus s subsp. obc ea subsp. pruin	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Capparis l Chrysopog Cleome vis Convolvula	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. o olathera staridis gardneri lasiantha gon fallax scosa us angustissi	herbland. hum calycina		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi	otiana o ls alsino a forrest prea polymo membra a occide lium rart ulon serr heliptero macroce obovatus a erema australis lutinosa . Spicifo	ccidentalis ides var. vil tii rpha unaceum ntalis subsj um ulatum pides phalus s subsp. obc ea subsp. pruin	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Capparis l Chrysopog Cleome vis Convolvul angustissin	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. o olathera staridis gardneri lasiantha gon fallax scosa us angustissi	imus subsp.		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp	otiana o s alsino a forrest orea polymo membra a occide lium rart ulon serr helipterco macroce obovatus a eremat australis lutinosa . Spicifo /90)	ccidentalis ides var. vil tii rpha unaceum ntalis subsj um ulatum pides phalus s subsp. obc ea subsp. pruin	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulace Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Aristida ha Capparis l Chrysopog Cleome vis Convolvul angustissii Cucumis n	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa ulycina var. o olathera staridis gardneri lasiantha gon fallax scosa us angustissi mus	ins open tuss herbland. num calycina imus subsp. nus		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp s.n. 14/8	otiana o las alsinol ja forrest orea polymo membra a occide dium raru ulon serr helipterco macroce obovatus a eremaa australis lutinosa . Spicifo /90) ulifera	ccidentalis ides var. vil tii rpha unaceum ntalis subsp un ulatum oides phalus s subsp. obd ea subsp. prui rm panicles	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia pru Aristida ca Aristida ha Aristida ha Capparis h Chrysopog Cleome vis Convolvul angustissin Cucumis n Dactylocte Dysphania	enium radula stralis open innata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera tzaridis gardneri lasiantha gon fallax scosa us angustisst maderaspatat enium radula a rhadinostad	ins open tuss herbland. num calycina imus subsp. nus ins chya		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp s.n. 14/8 Sida fibu Tephros. Themeda	otiana o la alsino la forrest orea polymo membra la occide lium rart ulon serr helipterc macroce obovatus a erema australis lutinosa lutinosa . Spicifo /90) ulifera ia supina a triandr	ccidentalis ides var. vil tii rpha unaceum ntalis subsp un ulatum oides phalus s subsp. obc ea subsp. prui rm panicles	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia apu Aristida ca Aristida ha Aristida ha Capparis h Chrysopog Cleome vis Convolvul angustissin Cucumis n Dactylocte Dysphania Enchylaen	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera staridis gardneri lasiantha gon fallax scosa us angustissi mus naderaspatar enium radula a tomentosa	imus subsp. num imus subsp. nus ins chya		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocan Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp s.n. 14/8 Sida fibu Tephros. Themeda Tragus a	otiana o la alsino ja forrest orea polymo membra a occide lium rart don serr helipterc macroce obovatus a eremat australis lutinosa . Spicifo /90) ulifera ia supina a triandr uustralia	ccidentalis ides var. vil tii rpha unaceum ntalis subsp un ulatum oides phalus s subsp. obc ea subsp. prui rm panicles	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
_	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Acacia apu Aristida ca Aristida ha Aristida la Boerhavia Capparis h Chrysopog Cleome vis Convolvul angustissin Cucumis n Dactylocte Dysphania Enchylaen Enneapoga	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera alycina var. a olathera gardneri lasiantha gon fallax scosa us angustissi mus naderaspatar enium radula a tomentosa on polyphyll	imus subsp. num imus subsp. nus ins chya		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocau Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp s.n. 14/8 Sida fibu Tephrost Themeda Tragus a Triraphi	otiana o la alsino la forrest orea a polymo membra a occide lium rart alon serr helipterco macroce obovatus a eremat australis lutinosa lutinosa lutinosa lutinosa a eremat a supino a triandr uustralia s mollis	ccidentalis ides var. vil ides var. vil tii rpha unaceum ntalis subsp unatum bides phalus s subsp. obd ea subsp. prui. rm panicles a nus	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa
	Dactylocte Salsola au Bidens bip Chloris vin *Malvastr *Portulaca Abutilon o Acacia apu Aristida ca Aristida ha Aristida la Boerhavia Capparis l Chrysopog Cleome vis Convolvul angustissii Cucumis n Dactylocte Dysphania Enchylaen Enneapog Eremophil	enium radula stralis open vinnata rgata um americar a oleracea tocarpum taneura uinocarpa alycina var. a olathera staridis gardneri lasiantha gon fallax scosa us angustissi mus naderaspatar enium radula a tomentosa	imus subsp. num imus subsp. nus ins chya		d with Nic Evolvulu Goodeni Hakea la Ipomoea Iseilema Nicotian Paspalia Pterocan Ptilotus Ptilotus Rhagodi Salsola a Senna gi Sida ?sp s.n. 14/8 Sida fibu Tephros. Themeda Tragus a	otiana o la alsino la forrest orea a polymo membra a occide lium rart alon serr helipterco macroce obovatus a eremat australis lutinosa lutinosa lutinosa lutinosa a eremat a supino a triandr uustralia s mollis	ccidentalis ides var. vil ides var. vil tii rpha unaceum ntalis subsp unatum bides phalus s subsp. obd ea subsp. prui. rm panicles a nus	subsp. <i>obliqua</i> , llosicalyx p. obliqua ovatus nosa



Botanist	Linda	Date	3/30/201	2	Site area		Quadrat :	50 x 50 m
Location	50K	1	685020 r	nE	7468502	mN	Elevatio	n 737 m
Topography and Geology	Landform: Soil: red cla Geology: 5	ay.		s and pebble	s.			
Veg Condition	4	Dist	urbances	weeds, gra tracks	zing,	Land S	System	МсКау
Site Photo								
Vegetation				es over <i>Cym</i> es very open		mbiguus	, Aristida c	ontorta closed
Species	Abutilon ot Acacia apta Acacia pru Aristida co Aristida co Boerhavia	ineura inocarpa ntorta			Gomphr Ipomoed	ena cuni 1 polymo m didym	um subsp.	-



Level 2 Flor	a and vo		Survey R		55	-	
Linda	Date	3/31/2012	2	Site area	L	Quadrat 5	50 x 50 m
50K		684817 n	nE	7467822	mN	Elevation	n 725 m
Soil: red cla	у.		s and pebbles	5.			
5	Distu	rbances	erosion, tra	mpling	Land S	System	Wannamunna
prostrata, B		acia nachy	<i>acra</i> scattere	ed shrubs c	over Dvsi	phania kalp	ari Goodenia
grassland. Abutilon oto					torta, Pe	rotis rara v	ery open tussock
	Linda 50K Landform: F Soil: red clay Geology: 20 5 5 <i>Acacia dicty</i>	Linda Date 50K Landform: Flat open pla Soil: red clay. Geology: 20% cover of 1 5 Distu	LindaDate3/31/201250K684817 nLandform: Flat open plain Soil: red clay. Geology: 20% cover of BIF gravels5Disturbances	Linda Date 3/31/2012 50K 684817 mE Landform: Flat open plain Soil: red clay. Geology: 20% cover of BIF gravels and pebbles 5 Disturbances \$5 Disturbances	Linda Date 3/31/2012 Site area 50K 684817 mE 7467822 Landform: Flat open plain soil: red clay. Geology: 20% cover of BIF gravels and pebbles. 5 Disturbances weeds, grazing, erosion, trampling of vegetation	Linda Date 3/31/2012 Site area 50K 684817 mE 7467822 mN Landform: Flat open plain Soil: red clay. Geology: 20% cover of BIF gravels and pebbles. soil: red clay. Geology: 20% cover of BIF gravels and pebbles. 5 Disturbances weeds, grazing, erosion, trampling Land S	50K 684817 mE 7467822 mN Elevation Landform: Flat open plain Soil: red clay. Geology: 20% cover of BIF gravels and pebbles. seeds, grazing, erosion, trampling of vegetation Land System 5 Disturbances weeds, grazing, erosion, trampling of vegetation Land System



Chid	Date	3/31/201	2	Site area		Quadrat 5	50 x 50 m
_						-	
Landform Slope: lev Soil: oran	zel. Ige brown clay	у.					1
2	Dist	urbances	weeds, cat nearby	ttle, roads	Land S	System	Wannamunna
	otaneura low o Perotis rara t						s over <i>Themeda</i> d.
	<i>Perotis rara</i> t			ixed specie	s very op		ıd.
triandra,	Perotis rara t otaneura			ixed specie	s very o <u>p</u> <i>is alsino</i>	pen herblan <i>ides</i> var. <i>vil</i>	ıd.
triandra, Acacia ap	Perotis rara t otaneura hera nana			ixed specie Evolvuli	s very o _l ıs alsino tylis dich	pen herblan <i>ides</i> var. vii notoma	ıd.
triandra, A Acacia ap Alternanti Aristida c	Perotis rara t otaneura hera nana contorta			ixed specie Evolvuli Fimbrist Goodent	s very o <u>p</u> is alsino tylis dich ia prostr	pen herblan ides var. vin notoma ata	ıd.
triandra, A Acacia ap Alternanti Aristida c Bidens bip	Perotis rara t otaneura hera nana contorta pinnata			ixed specie Evolvuli Fimbrist Goodent Indigofe	s very op us alsino tylis dich ia prostr ra georg	pen herblan ides var. vin notoma ata gei	ıd.
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid	Perotis rara t otaneura hera nana contorta pinnata a gardneri	ussock gras	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiut	s very og us alsino tylis dich ia prostr ra georg n echina	pen herblan ides var. vin notoma ata gei tum	ıd.
triandra, A Acacia ap Alternanti Aristida c Bidens bij Boerhavid Brachysco	Perotis rara t otaneura hera nana contorta pinnata	ussock gras	sland and m	ixed specie Evolvulu Fimbrist Gooden Indigofe Lepidiun Lysiana	s very og us alsino tylis dich ia prostr ra georg n echina murrayi	pen herblan ides var. via totoma ata gei tum	d. <i>llosicalyx</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662)	ussock gras	sland and m	ixed specie Evolvulu Fimbrist Gooden Indigofe Lepidiun Lysiana	s very op us alsino tylis dich ia prostr ra georg n echina murrayi a occide	pen herblan ides var. vin notoma ata gei tum	d. <i>llosicalyx</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychosper	ussock gras	sland and m	ixed specie Evolvulu Fimbrist Gooden Indigofe Lepidiun Lysiana Nicotian	s very oj us alsino tylis dich ia prostr ra georg n echina murrayi ta occide rara	pen herblan ides var. vin totoma tata gei tum entalis subs	d. <i>llosicalyx</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen ogon fallax	ussock gras	sland and m	ixed specie Evolvult Fimbrist Gooden Indigofe Lepidiun Lysiana Nicotian Perotist	s very oj us alsino tylis dich ia prostr ra georg n echina murrayi pa occide rara aca olerc	pen herblan ides var. vin aotoma ata gei tum entalis subs acea	d. <i>llosicalyx</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysce (S. van Le Calandrin Chrysopo Cleome vi	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen ogon fallax iscosa	ussock gras	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiun Lysiana Nicotian Perotist *Portula	s very oj us alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olerc ulon seri	pen herblan ides var. via ata gei tum entalis subs acea rulatum	d. <i>llosicalyx</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavic Brachysce (S. van Le Calandrin Chrysopo Cleome vi Cucumis n	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen ogon fallax iscosa maderaspatan	ussock gras	sland and m	ixed specie Evolvulu Fimbrist Goodent Indigofe Lepidiur Lysiana Nicotian Perotist *Portula Pterocat Ptilotus	s very oj is alsino tylis dich ia prostr ra georg n echina murrayi na occide rara aca olerc ulon serr clementi	pen herblan ides var. via ata gei atum entalis subs acea rulatum ii	d. <i>llosicalyx</i> p. <i>obliqua</i>
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavia Brachysce (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychosper ogon fallax iscosa maderaspatan tenium radula	ussock gras	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiur Lysiana Nicotian Perotist *Portula Pterocat Ptilotus Ptilotus	s very og is alsino tylis dich ia prostr ra georg n echina murrayi na occide rara aca olera ulon serr clementi gaudich	pen herblan ides var. via ata gei tum entalis subs acea rulatum ii audii var. g	d. llosicalyx p. obliqua gaudichaudii
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphanid	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen ogon fallax iscosa maderaspatar tenium radula a glomulifera	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiun Lysiana Nicotian Perotist *Portula Pterocan Ptilotus Ptilotus Ptilotus	s very of is alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olera ulon serr clementi gaudich obovatu.	pen herblan ides var. via ata gei tum entalis subs acea rulatum ii audii var. g s subsp. obe	d. llosicalyx p. obliqua gaudichaudii
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphanid Dysphanid	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen ogon fallax iscosa maderaspatan tenium radula ja glomulifera ja rhadinostac	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Goodeni Indigofe Lepidiur Lysiana Nicotian Perotist *Portula Pterocan Ptilotus Ptilotus Rhyncha	s very of us alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olerc ulon serr clementi gaudich obovatu urrhena	pen herblan ides var. via ata gei tum entalis subs acea rulatum ii audii var. g s subsp. obo linearis	d. llosicalyx p. obliqua gaudichaudii ovatus
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphania Enchylaen	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychosper gon fallax iscosa maderaspatan tenium radula fa glomulifera fa rhadinostac na tomentosa	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Gooden Indigofe Lepidiur Lysiana Nicotian Perotist *Portula Pterocan Ptilotus Ptilotus Rhyncha Sida sp.	s very of us alsino tylis dich ia prostr ra georg n echina murrayi a occide rara ulon serr clementa gaudich obovatu urrhena h Tiny fru	pen herblan ides var. via ata gei tum entalis subs acea rulatum ii audii var. g s subsp. ob linearis iits (AA Mi	d. llosicalyx p. obliqua gaudichaudii
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavia Brachysco (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphania Enchylaen Enteropog	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen gon fallax iscosa maderaspatar tenium radula a glomulifera a rhadinostac na tomentosa gon ramosus	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiun Lysiana Nicotian Perotist *Portula Pterocat Ptilotus Ptilotus Rhyncha Sida sp. Solanun	s very og us alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olerc ulon serr clementa gaudich obovatu, urrhena i Tiny fru a ferociss	pen herblan ides var. via ata ata gei tum entalis subs acea rulatum ii audii var. g s subsp. ob linearis iits (AA Mi simum	d. llosicalyx p. obliqua gaudichaudii ovatus tchell PRP1152)
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysco (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphania Enchylaen Enteropog Eragrostis	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen gon fallax iscosa maderaspatan tenium radula a glomulifera a rhadinostac na tomentosa gon ramosus s cumingii	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiun Lysiana Nicotian Perotist *Portula Pterocan Ptilotus Ptilotus Rhyncha Sida sp. Solanum Spartoth	s very og us alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olerc ulon serr clementi gaudich obovatu urrhena i Tiny fru a ferociss amnella	pen herblan ides var. via ata ata gei tum entalis subsp acea rulatum ii audii var. g s subsp. obd linearis iits (AA Mi simum teucriiflord	d. llosicalyx p. obliqua gaudichaudii ovatus tchell PRP1152)
triandra, A Acacia ap Alternanti Aristida c Bidens bip Boerhavid Brachysce (S. van Le Calandrin Chrysopo Cleome vi Cucumis n Dactyloct Dysphania Enchylaen Enteropog Eragrostis Eragrostis	Perotis rara t otaneura hera nana contorta pinnata a gardneri ome sp. Wann eeuwen 4662) nia ptychospen gon fallax iscosa maderaspatar tenium radula a glomulifera a rhadinostac na tomentosa gon ramosus	na Munna Fl rma nus subsp. eren	sland and m	ixed specie Evolvult Fimbrist Goodent Indigofe Lepidiur Lysiana Nicotian Perotis n *Portula Pterocat Ptilotus Ptilotus Rhyncha Sida sp. Solanum Spartoth Stenoped	s very of is alsino tylis dich ia prostr ra georg n echina murrayi a occide rara aca olerc ulon serr clementi gaudich obovatu urrhena i tannella talum an	pen herblan ides var. via ata ata gei tum entalis subsp acea rulatum ii audii var. g s subsp. obd linearis iits (AA Mi simum teucriiflord	d. llosicalyx p. obliqua gaudichaudii ovatus tchell PRP1152)
	Chid 50K Landform Slope: lev Soil: oran Geology:	ChidDate50KLandform: Floodplain Slope: level. Soil: orange brown clay Geology: no rock outer	ChidDate3/31/201250K684774 mLandform: Floodplain Slope: level. Soil: orange brown clay. Geology: no rock outcrop or coarse	Chid Date 3/31/2012 50K 684774 mE Landform: Floodplain Slope: level. Soil: orange brown clay. Geology: no rock outcrop or coarse fragments. 2 Disturbances	50K 684774 mE 7467680 Landform: Floodplain Slope: level. Soil: orange brown clay. Geology: no rock outcrop or coarse fragments. weeds, cattle, roads 2 Disturbances weeds, cattle, roads	50K 684774 mE 7467680 mN Landform: Floodplain Slope: level. Soil: orange brown clay. Geology: no rock outcrop or coarse fragments. weeds, cattle, roads Land 6	50K 684774 mE 7467680 mN Elevation Landform: Floodplain Slope: level. Soil: orange brown clay. Elevation Soil: orange brown clay. Geology: no rock outcrop or coarse fragments. Image: state of the state



Botanist	Linda	Date	3/31/2012		Site area		Quadrat 5	50 x 50 m
Location	50K		683540 m		7469711	mN	Elevation	
Topography and Geology	Landform: U: Aspect and S Soil: red clay Geology: 80%	ndulating pla lope: 235° ge	in around ently inclin	base of brea ned.	akaway			
Veg Condition	3	Disturl	bances	grazing		Land S	ystem	Boolgeeda
Site Photo								
	Fucabutus la	ugophloig sy	abon <i>laua</i>	anhloig Fue		monhull		low trees over
Vegetation	Eucalyptus le Acacia bivenu grassland. Acacia bivenu	osa, Acacia e				Triodia v	<i>viseana</i> op	low trees over en hummock



Lamb Creek Botanist	Chid	Date	3/31/2012	2	Site area		Quadrat 5	0 x 50 m
Location	50K	Date	683234 n		7470594		Elevation	
Location		. Cantla alar			/4/0394		Lievation	1 /49 111
Topography and Geology	Aspect an Soil: oran	d Slope: WS ge fine sand	be at base of l SW gently inc y clay. of ironstone p	clined.	cobbles.			
Veg Condition	2	Dis	turbances	cattle, trac nearby	ks	Land S	ystem	McKay
	111				In. Par			
Site Photo								
Site Photo Vegetation			Derma, Acacia S. van Leeuwo					nd over <i>Triodia</i>
	sp. Shove	lanna Hill (S <i>loxa</i> var. <i>add</i>	S. van Leeuwe		iodia wised Hakea la	<i>ina</i> humn orea	nock grassl	
Vegetation	sp. Shove Acacia aa Acacia aa	lanna Hill (S loxa var. add lsurgens	S. van Leeuwe		iodia wised Hakea la Keraudr	ana humn orea senia nepl	nock grassl	
Vegetation	sp. Shove Acacia aa Acacia aa Acacia bi	lanna Hill (S loxa var. add lsurgens venosa	S. van Leeuwe		iodia wised Hakea la Keraudr Ptilotus	ana humn orea venia nepl rotundifo	nock grassl hrosperma lius	
Vegetation	sp. Shove Acacia aa Acacia aa Acacia bi Acacia di	lanna Hill (S loxa var. add lsurgens venosa ctyophleba	S. van Leeuwe		iodia wised Hakea la Keraudr Ptilotus Schizach	una humn orea cenia nepl rotundifo hyrium fro	nock grassl hrosperma olius agile	and.
Vegetation	sp. Shove Acacia aa Acacia aa Acacia bi Acacia di Acacia ma	lanna Hill (S loxa var. ado lsurgens venosa ctyophleba aitlandii	S. van Leeuwe		iodia wised Hakea la Keraudr Ptilotus Schizach Senna a	una humn prea cenia nepl rotundifo hyrium fro rtemisioio	nock grassk hrosperma blius agile des subsp. a	and. Digophylla
Vegetation	sp. Shove Acacia aa Acacia aa Acacia bi Acacia di Acacia ma Bulbostyli	lanna Hill (S loxa var. ado lsurgens venosa ctyophleba aitlandii is barbata	S. van Leeuwo oxa		iodia wised Hakea la Keraudr Ptilotus Schizach Senna a Senna g	una humn orea renia nepl rotundifo nyrium fra rtemisioia lutinosa s	nock grassl hrosperma ilius agile des subsp. c subsp. glutin	and. oligophylla nosa
Vegetation	sp. Shove Acacia aa Acacia aa Acacia bi Acacia di Acacia di Bulbostyli Cymbopog	lanna Hill (S loxa var. add lsurgens venosa ctyophleba aitlandii is barbata gon ambigut	S. van Leeuwo oxa	en 3835), <i>Tr</i>	iodia wised Hakea la Keraudr Ptilotus Schizach Senna a Senna g	una humn orea renia nepl rotundifo nyrium fra rtemisioia lutinosa s	nock grassl hrosperma ilius agile des subsp. c subsp. glutin	and. Digophylla



Botanist	Chid	Date	3/31/201	2	Site area		Quadrat 50) x 50 m
Location	50K		683086 r		7471288		Elevation	
Topography and Geology	Landform Slope: ver Soil: red f	: Flat plain y gently linc ine sandy cla ironstone pet	lined. y.					
Veg Condition	3	Dist	urbances	weeds, cat	tle	Land	System	МсКау
Site Photo								
Vegetation	artemisioi	<i>taneura, Aca</i> des subsp. ol d Aristida ind	<i>igophylla</i> op	oen shrublan	d over Trio	dia wise	eana scattere	<i>ngifolia</i> , <i>Senna</i> 1 hummock
Species	Abutilon o Acacia ap Acacia ino Acacia mo				Gossypi		rale nuifolium	



		1 I I I I I I I I I I I I I I I I I I I		getation Survey - Site L			adrat 50 x 50 m			
Botanist	Linda	Date	3/31/201	2	Site area	~				
Location	50K		683397 n	nE	7472548 mN	Elevatio	Elevation 741 m			
Topography and Geology	Landform: Flat open plain in-between rollin hills Soil: dark red clay. Geology: 40% cover of BIF, pisolite gravels up to 2 cm.									
Veg Condition	3	Dist	urbances	grazing, ero	osion La	nd System	McKay			
Site Photo										
Vegetation	open shru	<i>s gamophylla</i> bland over m grassland.	<i>i</i> low open v ixed species	woodland over s open tussock	r <i>Acacia ancis</i> c grassland and	trocarpa, Acac 1 Triodia brizoi	<i>ia elachantha</i> tall <i>des</i> very open			
Species	Acacia ela Aristida co Cymbopog Dysphania Eragrostis Eucalyptu Eulalia au Euphorbia Evolvulus	ontorta gon obtectus a rhadinostac s gamophylla trea a biconvexa alsinoides va microptera	l	'yx	Paraneurach Polycarpaea Ptilotus calo Ptilotus rotu Scaevola par Schizachyriu Senna artem Senna glutin Senna notab	e holtzei Istachyus Indifolius Irvifolia subsp. p Im fragile Isioides subsp. Isio subsp. prut Iis	pilbarae oligophylla			



Botanist	Chid	Date	4/1/2012		Site area		Quadrat 5	0 x 50 m
Location	50K		683957 r	nE	7473448 1	mN	Elevation	732 m
Topography and Geology			gently incli	ned.		cobbles.		
Veg Condition	2	Dist	turbances	weeds, cat	tle	Land Sy	ystem	Boolgeeda
Site Photo								
Vegetation	open shru	<i>a hamersleyar</i> Ibland over <i>Ta</i> Is grassland.						<i>inaequilatera</i> tal wwen 3835)
Species	Acacia m Aristida h Cleroden				Keraudre Senna gla	us aurani n didymu enia neph		



Lamb Creek	Level 2 Flo	ra and ve	Berne			••			
Botanist	Chid	Date	4/1/2012		Site area		Quadrat :	50 x 50 m	
Location	50K		684557 m	E	7473917	mN	Elevation	n 728 m	
Topography and Geology	Aspect and Soil: red cla	Gently undul Slope: 280° ay. 5% cover of	gently inclin	ned			ll flat drai	nage lines	
Veg Condition	0	Distu	rbances	grazing, er weeds	osion,	Land S	ystem	Boolg	eeda
Site Photo									ALL ALL
				white Ex					
Vegetation	Acacia elac	leucophloia chantha, Acad zoides, Triod	cia inaequil	atera, Santa	lum lance				
_	Acacia elac Triodia briz	chantha, Acad	cia inaequil	atera, Santa	<i>lum lanced</i> assland.		ll open shr		
_	Acacia elac Triodia briz Acacia el	chantha, Acad zoides, Triod	cia inaequili ia wiseana l	atera, Santa	lum lanced assland. Polyca	o <i>latum</i> ta	ll open shr oltzei		
_	Acacia elac Triodia briz Acacia el	chantha, Acad zoides, Triod lachantha naequilatera	cia inaequili ia wiseana l	atera, Santa	lum lanced assland. Polyca Ptilotu	olatum ta urpaea h s calosta	ll open shr oltzei achyus		
_	Acacia elac Triodia briz Acacia el Acacia in	chantha, Acad zoides, Triod lachantha naequilatera contorta	cia inaequili ia wiseana l	atera, Santa	lum lanced assland. Polyca Ptilotu Ptilotu	olatum ta urpaea h s calosta	ll open shr oltzei achyus tus subsp.	ubland over	
_	Acacia elac Triodia briz Acacia el Acacia in Aristida e Cleome v	chantha, Acad zoides, Triod lachantha naequilatera contorta	cia inaequil ia wiseana l	atera, Santa	lum lanced assland. Polyca Ptilotu Ptilotu Ptilotu	olatum ta urpaea h s calosta s obova	ll open shr oltzei achyus tus subsp. lifolius	ubland over	
_	Acacia elac Triodia briz Acacia el Acacia in Aristida e Cleome v Corymbia	chantha, Acad zoides, Triod lachantha naequilatera contorta viscosa a deserticolo	cia inaequil ia wiseana l g	atera, Santa	lum lanced rassland. Polyca Ptilotu Ptilotu Ptilotu Santal	platum ta urpaea h is calosta is obovat is rotuna um lance	ll open shr oltzei achyus tus subsp. lifolius eolatum	ubland over	
Vegetation Species	Acacia elac Triodia briz Acacia el Acacia in Aristida e Cleome v Corymbia Eucalypti	chantha, Acad zoides, Triod lachantha naequilatera contorta viscosa a deserticolo us gamophy	cia inaequil ia wiseana l a a illa	atera, Santa hummock gi	lum lanced assland. Polyco Ptilotu Ptilotu Ptilotu Santal Schiza	platum ta urpaea h s calosta s obova s rotuna um lanca chyrium	ll open shr oltzei achyus tus subsp. lifolius eolatum fragile	ubland over	
_	Acacia elac Triodia briz Acacia el Acacia in Aristida o Cleome v Corymbia Eucalypta Eucalypta	chantha, Acad zoides, Triod lachantha naequilatera contorta viscosa a deserticola us gamophy us leucophlo	cia inaequil ia wiseana l a ila pia subsp. a	atera, Santa hummock gi	lum lanced assland. Polyca Ptilotu Ptilotu Santal Schiza Senna	platum ta prpaea h s calosta s obova s rotuna um lanca chyrium artemisi	ll open shr oltzei achyus tus subsp. lifolius eolatum fragile ioides sub	ubland over	
_	Acacia elac Triodia briz Acacia el Acacia in Aristida e Cleome v Corymbia Eucalypta Eucalypta Fimbristy	chantha, Acad zoides, Triod lachantha naequilatera contorta viscosa a deserticolo us gamophy us leucophlo ylis simulan.	cia inaequil ia wiseana a a alla oia subsp. a	atera, Santa hummock gi	lum lancea assland. Polyca Ptilotu Ptilotu Santal Schiza Senna Senna	platum ta prpaea h s calosta s obova s rotuna um lance chyrium artemisi glutinos	ll open shr oltzei achyus tus subsp. lifolius eolatum fragile ioides sub a subsp. µ	ubland over	
_	Acacia elac Triodia briz Acacia el Acacia in Aristida e Cleome v Corymbia Eucalypta Eucalypta Fimbristy Goodenia	chantha, Acad zoides, Triod lachantha naequilatera contorta viscosa a deserticola us gamophy us leucophlo	cia inaequil ia wiseana a a alla oia subsp. a	atera, Santa hummock gi	lum lanced assland. Polyca Ptilotu Ptilotu Santal Schiza Senna Senna Solanu	platum ta prpaea h s calosta s obova s rotuna um lanca chyrium artemisi	ll open shr oltzei achyus tus subsp. lifolius eolatum fragile ioides sub a subsp. µ phyllum	ubland over	



Botanist	Chid	Dat	e 4	4/1/2012		Site area		Quadrat 5	50 x 50 m
Location	50K			686619 m	E	7474514	mN	Elevation	n 745 m
Topography and Geology	Aspect an Soil: red of	d Slope orange s	: N gentl andy cla	ly to mode y.	ll, minor dr erately incli ravel, pebbl	ned.	es dissect	ing.	
Veg Condition	2		Disturl	bances	weeds		Land S	System	Boolgeeda
Site Photo				Y					
		No.							
Vegetation					khamii tall o			r <i>Triodia</i> sp	p. Shovelanna Hill
Vegetation Species	(S. van Le	eeuwen	3835), T	riodia wis		ock grassl	and.		p. Shovelanna Hill
	(S. van Le	eeuwen adoxa	3835), <i>T</i> . var. <i>ado</i>	riodia wis		ock grassl	and. <i>pium rol</i>	binsonii	p. Shovelanna Hill
_	(S. van Le Acacia Acacia	eeuwen adoxa adsurg	3835), T. var. ado. ens	riodia wis		ock grassl Gossyp Grevil	and. pium rol lea wick	binsonii	p. Shovelanna Hill
_	(S. van Le Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos	3835), T var. ado ens sa	riodia wis		ock grassl Gossyp Grevil Hakea	and. pium rol lea wick lorea	binsonii hamii	-
_	(S. van Le Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop	3835), T var. ado. ens sa ohleba	riodia wis		ock grassl Gossyp Grevil Hakea Hibisc	and. pium rol lea wick lorea us sturti	binsonii hamii ii var. cam	p. Shovelanna Hill
_	(S. van Le Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop elachan	3835), T var. ado ens sa bhleba ntha	riodia wis		ock grassl Gossy Grevil Hakea Hibisc Indigo	and. pium rol lea wick lorea us sturti fera mo	binsonii hamii ii var. cam nophylla	npylochlamys
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop elachan inaequi	3835), T var. ado ens sa ohleba otha ilatera	riodia wis		ock grassl Gossy Grevil Hakea Hibisc Indigo Paran	and. pium rol lea wick lorea us sturti fera mo eurachn	binsonii hamii ii var. cam nophylla e muelleri	npylochlamys
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop elachan inaequi tenuiss	3835), T var. ado ens sa vhleba ntha ilatera ima	riodia wis		ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca	and. pium rol lea wick lorea us sturti fera mo eurachn urpaea l	binsonii hamii ii var. cam nophylla e muelleri ongiflora	npylochlamys
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa v adsurg bivenos dictyop elachar inaequi tenuiss xiphop	3835), T var. ado ens sa ohleba ohleba ilatera ilatera ima hylla	riodia wis		ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca Ptilotu	and. pium rol lea wick lorea us sturti fera mo eurachn urpaea lu urpaea lu	binsonii hamii ii var. cam nophylla e muelleri ongiflora asius	npylochlamys
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop elachan inaequa tenuiss xiphop u holath	3835), T var. ado ens sa ohleba ohleba intha ilatera ima ima hylla nera	iriodia wisi		ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca Ptilotu Ptilotu	and. pium rol lea wick lorea us sturth fera mo eurachn urpaea l us astrol us calost	binsonii hamii ii var. cam nophylla e muelleri ongiflora asius achyus	npylochlamys i
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia	eeuwen adoxa adsurg bivenos dictyop elachar inaequi tenuiss xiphop u holath u inaequ	3835), T var. ado ens sa ohleba ntha ilatera ima hylla nera uiglumis	iriodia wisi		ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca Ptilotu Scaevo	and. pium rol lea wick lorea us sturth fera mo eurachn urpaea l us astrol us calost pla parv	binsonii hamii ii var. cam nophylla e muelleri ongiflora asius achyus ifolia subs	npylochlamys
_	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Bulbost	eeuwen adoxa adsurg bivenos dictyop elachan inaequa tenuiss xiphop u holath u inaequ ylis ban	3835), T var. ado ens sa ohleba ohleba ilatera ilatera ima hylla nera uiglumis rbata	<u>riodia wis</u> i xa S	eana humm	ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca Ptilotu Scaevo Schiza	and. pium rol lea wick lorea us sturth fera mo eurachn urpaea l us astrol us astrol us calost pla parv chyrium	binsonii chamii ii var. cam nophylla e muelleri ongiflora asius asius achyus ifolia subs ifolia subs	npylochlamys i sp. pilbarae
_	(S. van Le Acacia a Acacia a Bulbost	eeuwen adoxa adsurg bivenos dictyop elachar inaequi tenuiss xiphop i holath i inaequ ylis bar rus inco	3835), T var. ado ens sa phleba ntha ilatera ima hylla nera uiglumis rbata anus sul	iriodia wisi	eana humm	ock grassl Gossy Grevil Hakea Hibisc Indigo Parano Polyca Ptilotu Scaevo Schiza Senna	and. pium rol lea wick lorea us sturti fera mo eurachn urpaea l us astrol us calost pla parv chyrium glutinos	binsonii chamii ii var. cam nophylla e muelleri ongiflora asius achyus ifolia subs fragile sa subsp. g	npylochlamys i sp. pilbarae glutinosa
	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Daristida Bulbost Corchor Dampie	eeuwen adoxa adoxa adsurg bivenos dictyop elachar inaequa tenuiss xiphop n holath i inaequ ylis bar rus inco ra can	3835), T var. ado ens sa ohleba ohleba ilatera ilatera ima hylla nera uiglumis rbata anus sul dicans	<u>riodia wis</u> i xa S	eana humm	ock grassl Gossy Grevil Hakea Hibisc Indigo Paran Polyca Ptilotu Scaeva Schiza Senna Senna	and. pium rol lea wick lorea us sturth fera mo eurachn urpaea l us astrol us astrol us calost pla parv chyrium glutinos glutinos	binsonii chamii ii var. cam nophylla e muelleri ongiflora asius achyus ifolia subs ifolia subs fragile sa subsp. g sa subsp. g	npylochlamys i sp. pilbarae glutinosa
	(S. van Le Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Acacia Dampie Eriachn	eeuwen adoxa adsurg bivenos dictyop elachar inaequi tenuiss xiphop u holath u inaequi ylis bar ylis bar rus ince era can e arist	3835), T var. ado ens sa phleba phleba ilatera ima hylla hylla nera uiglumis rbata anus sul dicans idea	<u>riodia wisi</u> xa bsp. <i>litho</i> j	eana humm	ock grassl Gossy Grevil Hakea Hibisc Indigo Parana Polyca Ptilotu Scaeva Schiza Senna Senna Sida ?	and. pium rol lea wick lorea us sturth fera mo eurachn urpaea l us astrol us astrol s calost pla parv chyrium glutinos glutinos	binsonii chamii ii var. cam nophylla e muelleri ongiflora asius achyus ifolia subs ifolia subs fragile sa subsp. g sa subsp. g arpa	npylochlamys i sp. pilbarae glutinosa



Botanist	Linda	Date	4/1/2012		Site area		Quadrat 5	50 x 50 m
Location	50K		685993 n	nE	7474911	mN	Elevation	n 712 m
Topography and Geology	Aspect and Soil: red cl	Slope: 265 ay.	y undulating 5° (W) gently of BIF, chert,	inclined.				eet flow.
Veg Condition	3	Dis	turbances	grazing, er	rosion	Land S	System	Boolgeeda
Site Photo								
					i sa Sanyi			
Vegetation	Grevillea w	vickhamii, (cacia elachanth brizoides, Triod
Vegetation Species	Grevillea w wiseana op	vickhamii, (Gossypium ro		open shru	bland ov		brizoides, Trioa
	Grevillea w wiseana op Acacia a	<i>vickhamii,</i> o ben hummo	Gossypium ro ck grassland.		open shru	bland ov	er Triodia	brizoides, Trioa rma
	Grevillea w wiseana op Acacia a Acacia e	vickhamii, oen hummo ptaneura lachantha	Gossypium ro ck grassland.		open shru Kerau Paran	bland ov drenia n eurachn	er Triodia nephrospen ne muelleri	brizoides, Trioa rma
	Grevillea w wiseana op Acacia a Acacia e	vickhamii, (pen hummo ptaneura lachantha enuissima	Gossypium ro ck grassland.		Kerauk Parant Polyca	bland ov	er Triodia aephrospen e muellern aoltzei	brizoides, Trioa rma
	Grevillea w wiseana op Acacia a Acacia e Acacia te Aristida	vickhamii, (pen hummo ptaneura lachantha enuissima contorta	Gossypium ro ck grassland.		open shrul Kerau Paran Polyca Ptilotu	drenia n drenia n eurachn urpaea h s astrol	er Triodia nephrospen ne muellern noltzei asius	brizoides, Trioa rma
	Grevillea w wiseana op Acacia a Acacia e Acacia te Aristida Corymbi	vickhamii, (pen hummo ptaneura lachantha enuissima contorta a ?hamers	Gossypium ro ck grassland. sleyana		open shrulKerauParanPolycaPtilotuPtilotu	drenia n drenia n eurachn urpaea h es astrol	er Triodia nephrospen ne muellern noltzei asius nachyus	brizoides, Trioa rma i
	Grevillea w wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbop	vickhamii, (pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi	Gossypium ro ck grassland. sleyana guus		KerauParauPolycaPtilotaPtilotaPtilotaPtilota	drenia n eurachn urpaea h us astrol us calost us exalta	er Triodia nephrospen ne muellern noltzei nasius nachyus ntus var. ex	brizoides, Trioa rma i
	Grevillea v wiseana op Acacia a Acacia te Aristida Corymbi Cymbopo Cymbopo	vickhamii, (ben hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec	Gossypium ro ck grassland. sleyana guus ctus	binsonii tall	open shrulKerauParanPolycaPtilotuPtilotuPtilotuPtilotuPtilotuPtilotu	drenia m eurachn urpaea h as astrol as calost as exalta as rotuna	er Triodia nephrospen ne muellern noltzei asius achyus tus var. ex difolius	brizoides, Trioa rma i
	Grevillea w wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae	vickhamii, (pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa	Gossypium ro ck grassland. sleyana guus ctus subsp. mucr	binsonii tall	KerauParanPolycaPtilotaPtilotaPtilotaPtilotaPtilotaPtilotaRhynca	drenia n eurachn urpaea h us astrol us calost us exalta us rotuna hosia m	er Triodia aephrospen e muellern aoltzei asius fachyus tus var. ex difolius inima	brizoides, Trioa rma i xaltatus
	Grevillea v wiseana op Acacia a Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt	vickhamii, (ben hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop	Gossypium ro ck grassland. sleyana guus ctus subsp. mucr hylla	binsonii tall	open shrulKerauParanPolycaPtilotuPtilotuPtilotuPtilotuPtilotuRhyncuScaevo	drenia n eurachn urpaea h us astrol us calost us calost us calost us rotund hosia mu	er Triodia aephrospen e muellern aoltzei asius achyus tus var. ex difolius inima ifolia subs	brizoides, Trioa rma i
	Grevillea v wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt Fimbrist	vickhamii, (pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop ylis simulo	Gossypium ro ck grassland. guus ctus subsp. mucr hylla uns	binsonii tall	KerauParanPolycaPtilotaPtilotaPtilotaPtilotaPtilotaScaevaSchiza	drenia n eurachn urpaea h urpaea h us astrol us calost us calost us calost us calost us colost an hosia m us coluna chyrium	er Triodia i nephrospen ne muellern noltzei nasius fachyus tus var. ex difolius inima ifolia subs n fragile	brizoides, Trioa rma i xaltatus sp. pilbarae
	Grevillea v wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt Fimbrist Gossypii	vickhamii, (ben hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop	Gossypium ro ck grassland. sleyana guus ctus subsp. mucr hylla uns onii	binsonii tall	open shrulKerauParanPolycaPtilotuPtilotuPtilotuPtilotuScaevaSchizaSenna	drenia n eurachn urpaea h us astrol us calost us calost us calost us colost as rotuna hosia mu ola parv chyrium artemis	er Triodia aephrospen e muellern aoltzei asius achyus tus var. ex difolius inima ifolia subs n fragile ioides sub	brizoides, Trioa rma i xaltatus sp. pilbarae osp. oligophyll
	Grevillea v wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbopo Dodonae Eucalypt Fimbrist Gossypii Grevillea	vickhamii, G pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop ylis simula um robinso a wickham	Gossypium ro ck grassland. guus ctus subsp. mucr hylla uns onii	onata	KerauParanParanPolycaPtilotaPtilotaPtilotaPtilotaScaevaSchizaSennaSenna	drenia n eurachn urpaea h us astrol us calost us calost us calost us colost as rotuna hosia mu ola parv chyrium artemis	er Triodia i nephrospen ne muellern noltzei nasius fachyus tus var. ex difolius inima ifolia subs n fragile ioides sub sa subsp. p	brizoides, Trioa rma i xaltatus sp. pilbarae osp. oligophyll
	Grevillea v wiseana op Acacia a Acacia e Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt Fimbrist Gossypiu Grevillea Hibiscus	vickhamii, o pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop ylis simula um robinso a wickham sturtii van	Gossypium ro ck grassland. sleyana guus ctus subsp. mucr hylla uns onii c. campyloch	onata	open shru Kerau Paran Polyca Ptilotu Ptilotu Ptilotu Rhyncu Scaeva Schiza Senna Senna Sida a	drenia n drenia n eurachn urpaea h us astrol us calost us calost s calost as cotuna hosia m bla parv chyrium artemis glutinos renicola	er Triodia i nephrospen ne muellern noltzei asius tachyus tus var. ex difolius inima ifolia subs inima ifolia subs inima ifolia subs inima ioides sub sa subsp. p	brizoides, Trioa rma i xaltatus sp. pilbarae osp. oligophyll
	Grevillea v wiseana op Acacia a Acacia a Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt Fimbrist Gossypiu Grevillea Hibiscus Hybanth	vickhamii, (ben hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon ambi ogon obtec ea viscosa tus gamop ylis simula um robinso a wickham sturtii van us auranti	Gossypium ro ck grassland. sleyana guus ctus subsp. much hylla uns onii ii c. campyloch acus	onata	open shrulKerauParanPolycaPtilotaPtilotaPtilotaPtilotaScaevaSchizaSennaSida aSolani	drenia n drenia n eurachn urpaea h us astrol us calost us calost us calost us calost as calost us colata basia m chyrium artemis glutinos renicola um lasio	er Triodia i pephrospen e muellern oltzei asius achyus tus var. ex difolius inima ifolia subs ifolia subs ifolia subs inima ifolia subs inima ifolia subs inima ifolia subs inima ifolia subs inima	brizoides, Trioa rma i xaltatus sp. pilbarae osp. oligophyll
	Grevillea v wiseana op Acacia a Acacia a Acacia te Aristida Corymbi Cymbopo Cymbopo Dodonae Eucalypt Fimbrist Gossypiu Grevillea Hibiscus Hybanth Indigofer	vickhamii, o pen hummo ptaneura lachantha enuissima contorta a ?hamers ogon ambi ogon obtec ea viscosa fus gamop ylis simula um robinso a wickham sturtii van us auranti ra monoph	Gossypium ro ck grassland. sleyana guus ctus subsp. much hylla uns onii ii c. campyloch acus	obinsonii tall oonata alamys	open shru Kerau Paran Polyca Ptilotu Ptilotu Ptilotu Rhyncu Scaeva Schiza Senna Senna Sida a Solanu Tephro	drenia n drenia n eurachn urpaea h us astrol us calost us calost s calost as cotuna hosia m bla parv chyrium artemis glutinos renicola	er Triodia i nephrospen ne muellern noltzei asius fachyus tus var. ex difolius inima ifolia subs inima ifolia subs inima ifolia subs inima ifolia subs inima ifolia subs inima ifolia subs inima inima ifolia subs inima ini ini inima inima inima inima inima inima ini ini ini ini ini ini ini ini ini in	brizoides, Trioa rma i xaltatus sp. pilbarae osp. oligophyll



Lamb Creek l	Level 2 F		Scration	•				
Botanist	Chid	Date	4/1/2012		Site area		Quadrat :	50 x 50 m
Location	50K		687239 r	nE	7476050	mN	Elevation	n 724 m
Topography and Geology	Aspect ar Soil: red	n: Gentle slop nd Slope: NW sandy clay. 95% cover of	gently incli	ned.	es.			T
Veg Condition	1	Dist	urbances	none		Land S	System	Newman
Site Photo								
Vegetation	low open	shrubland ov						<i>ia nephrosperma</i> open hummock
Vegetation Species	low open grassland	shrubland ov			a Hill (S. v	van Leeu		
_	low open grassland Acacia	shrubland ov adsurgens	er <i>Triodia</i> sj		a Hill (S. v <i>Hyban</i>	an Leeu	wen 3835) rantiacus	
_	low open grassland Acacia Acacia	shrubland ov	er <i>Triodia</i> sj		a Hill (S. v Hyban Indigo	an Leeu thus au fera mo	wen 3835) rantiacus nophylla	open hummock
_	low open grassland Acacia Acacia Acacia	shrubland ov adsurgens ancistrocarp	er <i>Triodia</i> sj		a Hill (S. v Hyban Indigo Kerau	an Leeu thus au fera mo drenia r	wen 3835) rantiacus	open hummock
_	low open grassland Acacia Acacia Acacia Acacia	shrubland ov adsurgens ancistrocarp elachantha	er <i>Triodia</i> sj Da	p. Shovelanr	Hill (S. v Hyban Indigo Kerau Olden	an Leeu thus au fera mo drenia r landia c	wen 3835) rantiacus nophylla nephrosper rouchiana	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Amphip	shrubland ov adsurgens ancistrocarp elachantha hilliana	er <i>Triodia</i> sj Da	p. Shovelanr	Hill (S. v Hyban Indigo Kerau Olden Polyco	an Leeu thus au fera mo drenia r	wen 3835) rantiacus nophylla nephrospet rouchiand holtzei	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Amphip Aristida	shrubland ov adsurgens ancistrocarp elachantha hilliana pogon caricin	er <i>Triodia</i> sj pa nus subsp.	p. Shovelanr	Hill (S. v Hyban Indigo Kerau Olden Polyca Ptilotu	an Leeu thus au fera mo drenia r landia c urpaea l	wen 3835) rantiacus nophylla nephrosper rouchiana noltzei lasius	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Amphip Aristida Bulbosi	shrubland ov adsurgens ancistrocarp elachantha hilliana pogon caricin a holathera	er <i>Triodia</i> sj pa nus subsp.	p. Shovelanr	Hill (S. v Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu	thus au fera mo drenia r landia c urpaea l us astrol	wen 3835) rantiacus nophylla nephrospen rouchiand holtzei lasius tachyus	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Aristida Bulbosi Corym	shrubland ov adsurgens ancistrocarp elachantha hilliana bogon caricin a holathera tylis barbata	er <i>Triodia</i> sj pa nus subsp. la	p. Shovelanr	Hill (S. v Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu Ptilotu	thus au fera mo drenia r landia c urpaea l us astrol us calost us rotune	wen 3835) rantiacus nophylla nephrospen rouchiand holtzei lasius tachyus	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Aristida Bulbosi Corymb Cymbo	shrubland ov adsurgens ancistrocarp elachantha hilliana oogon caricin a holathera tylis barbata bia desertico	er <i>Triodia</i> sj pa nus subsp. la	p. Shovelanr	Hill (S. M Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu Schiza	thus au fera mo drenia r landia c urpaea h us astrol us calost us rotuna chyrium	wen 3835) rantiacus nophylla nephrospen rouchiand holtzei dasius dasius dasius dasius difolius n fragile	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Aristida Bulbost Corymi Cymbo Eriach	shrubland ov adsurgens ancistrocarp elachantha hilliana oogon caricin a holathera tylis barbata bia desertico pogon ambig ne helmsii	er <i>Triodia</i> sj pa nus subsp. la guus	p. Shovelanr	Hill (S. M Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu Schiza Senna	thus au fera mo drenia r landia c urpaea l us astrol us calost us rotune chyrium artemis	wen 3835) rantiacus nophylla nephrospen rouchiand holtzei dasius dasius dasius dasius difolius n fragile	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Aristida Bulbosi Corymi Cymboj Eriachi Gooder	shrubland ov adsurgens ancistrocarp elachantha hilliana bogon caricin a holathera tylis barbata bia desertico pogon ambig	er <i>Triodia</i> sj pa nus subsp. la guus ra	p. Shovelanr	Hill (S. M Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu Schiza Senna Solanu Triodu	an Leeu thus au fera mo drenia r landia c urpaea h s astrol us calost us calost us cotuna chyrium artemis um lasio a sp. Sh	wen 3835) rantiacus nophylla nephrosper rouchiand holtzei dasius tachyus difolius n fragile rioides sub phyllum ovelanna	open hummock
_	low open grassland Acacia Acacia Acacia Acacia Aristida Bulbost Corymi Cymbo Eriach Gooder Gooder	shrubland ov adsurgens ancistrocarp elachantha hilliana oogon caricin a holathera tylis barbata bia desertico pogon ambig ne helmsii nia micropte	er <i>Triodia</i> sj pa nus subsp. la guus ra na	p. Shovelanr	Hill (S. M Hyban Indigo Kerau Olden Polyca Ptilotu Ptilotu Schiza Senna Solanu Triodu	thus au thus au fera mo drenia r landia c urpaea h us astrol us calost us calost us rotun artemis un lasio	wen 3835) rantiacus nophylla nephrosper rouchiand holtzei dasius tachyus difolius n fragile rioides sub phyllum ovelanna	open hummock rma a osp. oligophylla



Land Creek		a and ve	getation	Survey - S	ite LCF	45		
Botanist	Chid	Date	3/28/2012	2	Site area		Quadrat 5	50 x 50 m
Location	50K		695148 n	nE	7476682	mN	Elevation	n 745 m
Topography and Geology	Landform: C Aspect and S Soil: dark or Geology: 95	Slope: N-S g ange-brown	gully very go sandy clay	7.		ops.		Γ
Veg Condition	2	Distu	irbances	cattle		Land S	ystem	tba
Site Photo								
						A ala a		
Vegetation		da var. pilbo	arensis tall	open shrubla	nd over Tr	iodia wi	seana hum	n robinsonii, mock grassland ussock grassland.
Vegetation Species	Acacia tumi	da var. pilba ogon ambig	arensis tall	open shrubla	nd over <i>Tr</i> Themeda ti	iodia wi: riandra N	seana hum	mock grassland
_	Acacia tumic and Cymbop	da var. pilbo ogon ambig ndicum	arensis tall	open shrubla	nd over Tr Themeda th Paspal	iodia wi riandra v lidium ta	seana hum very open ti	mock grassland ussock grassland.
_	Acacia tumic and Cymbop Abutilon i	da var. pilba ogon ambig ndicum venosa	arensis tall	open shrubla	nd over Tr Themeda ti Paspal Phylla	iodia wis riandra x lidium ta nthus ma	seana hum very open tr abulatum	mock grassland ussock grassland.
_	Acacia tumia and Cymbop Abutilon i Acacia biy Acacia mo	da var. pilba ogon ambig ndicum venosa	arensis tall guus, Eriaci	open shrubla hne helmsii, '	nd over Tr Themeda th Paspal Phylla Pteroc	iodia wi riandra N lidium ta nthus m aulon se	seana hum very open tu ubulatum aderaspat errulatum	mock grassland ussock grassland.
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia mo Acacia tur	da var. pilba ogon ambig ndicum venosa onticola	arensis tall guus, Eriaci bilbarensis	open shrubla hne helmsii, '	nd over Tr Themeda th Paspat Phylla Pteroc Ptilotu	iodia wi riandra N lidium ta nthus m aulon se	seana hum very open to abulatum aderaspat errulatum tus subsp.	mock grassland ussock grassland. rensis
_	Acacia tumia and Cymbop Abutilon i. Acacia biv Acacia ma Acacia tun Clerodena	da var. pilba ogon ambig ndicum venosa onticola nida var. p lrum ?tome	arensis tall guus, Eriaci pilbarensis entosum	open shrubla hne helmsii, '	nd over Tr Themeda tr Paspai Phylla Pteroc Ptilotu Rhynci	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi	seana hum very open to abulatum aderaspat errulatum tus subsp.	mock grassland ussock grassland. rensis obovatus
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia mo Acacia tur Clerodenc Corchorus	da var. pilba ogon ambig ndicum venosa onticola nida var. p lrum ?tome	arensis tall guus, Eriaci bilbarensis entosum pus subsp.	open shrubla	nd over Tr Themeda th Paspai Phylla Pteroc Ptilotu Rhynci Senna	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi	seana hum very open to abulatum aderaspat errulatum tus subsp. inima va subsp. g	mock grassland ussock grassland. rensis obovatus
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia tun Clerodena Corchorus Cucumis r	da var. pilba ogon ambig ndicum venosa onticola nida var. p trum ?toma s lasiocarp	arensis tall guus, Eriaci pilbarensis entosum pus subsp. tanus	open shrubla	nd over Tr Themeda th Paspan Phylla Pteroc Ptilotu Rhynch Senna Stemoo	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi glutinos	seana hum very open to abulatum aderaspat errulatum tus subsp. inima va subsp. g sa	mock grassland ussock grassland. eensis obovatus
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia tur Acacia tur Clerodena Corchorus Cucumis r Cymbopog	da var. pilbo ogon ambig ndicum venosa onticola nida var. p lrum ?tome s lasiocarp naderaspa	arensis tall guus, Eriaci bilbarensis entosum bus subsp. tanus uus	open shrubla	nd over Tr Themeda th Paspai Phylla Pteroc Ptilotu Rhynci Senna Stemoo Stemoo	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi glutinos dia gros.	seana hum very open to abulatum aderaspat errulatum tus subsp. inima va subsp. g sa	mock grassland ussock grassland. eensis obovatus glutinosa
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia tur Acacia tur Clerodena Corchorus Cucumis r Cymbopog	da var. pilbo ogon ambig ndicum venosa onticola nida var. p lrum ?tome s lasiocarp naderaspan gon ambigu la lachnoce	arensis tall guus, Eriaci bilbarensis entosum bus subsp. tanus uus	open shrubla	nd over Tr Themeda th Paspan Phylla Pteroc Ptilotu Rhynci Senna Stemoc Stemoc Stylobo	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi glutinos dia gros.	seana hum very open to abulatum aderaspat errulatum tus subsp. inima va subsp. g sa osa osa	mock grassland ussock grassland. eensis obovatus glutinosa
_	Acacia tumia and Cymbop Abutilon i Acacia biv Acacia tum Acacia tum Clerodena Corchorus Cucumis r Cymbopos Eremophi Eriachne	da var. pilba ogon ambig ndicum venosa onticola nida var. p lrum ?toma s lasiocarp naderaspa gon ambigu la lachnoca helmsii	arensis tall guus, Eriaci pilbarensis entosum pus subsp. tanus uus alyx	open shrubla	nd over Tr Themeda th Paspai Phylla Pteroc Ptilotu Rhynci Stemoc Stemoc Stemoc Stylobo Theme	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi glutinos dia gros. dia visco asium sp da trian	seana hum very open to aderaspat errulatum tus subsp. inima ea subsp. g sa osa osa pathulatum dra	mock grassland ussock grassland. eensis obovatus glutinosa
_	Acacia tumia and Cymbop Abutilon i Acacia biy Acacia tum Clerodena Corchorus Cucumis n Cymbopog Eremophi Eriachne Eucalyptu	da var. pilba ogon ambig ndicum venosa onticola nida var. p lrum ?toma s lasiocarp naderaspa gon ambigu la lachnoca helmsii	arensis tall guus, Eriaci pilbarensis entosum pus subsp. tanus uus alyx oia subsp.	open shrubla hne helmsii, '	nd over Tr Themeda th Paspan Phylla Pteroc Ptilotu Rhynci Senna Stemod Stemod Stemod Theme Theme	iodia wi riandra v lidium ta nthus ma aulon se s obova hosia mi glutinos dia gros. dia visco asium sp da trian	seana hum very open to abulatum aderaspat errulatum tus subsp. fnima va subsp. g sa osa osa oathulatum dra eylanicum	mock grassland ussock grassland. eensis obovatus glutinosa



Botanist	Chid	Date	3/28/2012	2	Site area	Quadra	at 50 x 50 m
Location	50K		694954 n	nE	7475581 n	nN Elevat	ion 1009 m
Topography and Geology	aphyAspect and SlopologySoil: brown clay		near top of very large ridge e: North facing, gently to moderately inclined. over of BIF, ironstone pebbles, cobbles, sheets.				
Veg Condition	2	Dist	urbances	weeds		Land System	tba
Site Photo							
						AS Y	
Vegetation		as leucophloid iseana humm				nophylla low op	en woodland over



Botanist	Linda	Date	3/31/201	•	Site LCF5		Ouadrat 4	50 x 50 m
Location	50K		684946 n		7467735 m	N	Elevation	
Topography and Geology	Landform Soil: red c	n: Flat plain clay. no rock outc						
Veg Condition	3	Dis	turbances	weeds, gra	azing 1	Land Sy	ystem	tba
Site Photo								
Vegetation	kalpari, S		ornishiana v	ery open her	fland over <i>Ga</i> bland and <i>C</i> y			, Dysphania guus, Aristida
Vegetation Species	kalpari, S contorta,	clerolaena c	ornishiana v	ery open her		vmbopoz		
	kalpari, S contorta, Acacia	clerolaena co Perotis rara aptaneura	ornishiana v tussock gras	ery open her	bland and Cy	orea	gon ambig	
	kalpari, S contorta, Acacia Acacia	clerolaena co Perotis rara	ornishiana v tussock gras pa	ery open her	bland and Cy Hakea le	mbopoz orea lium ra	gon ambig	
	kalpari, S contorta, Acacia Acacia Alterna	clerolaena co Perotis rara aptaneura dictyophleb	ornishiana v tussock gras pa	ery open her	bland and Cy Hakea la Paspalia	orea lium ra	gon ambig rum	
	kalpari, S contorta, A Acacia Acacia Alterna Aristida	clerolaena co Perotis rara aptaneura dictyophleb nthera nanc	ornishiana v tussock gras a a	ery open her	bland and Cy Hakea la Paspalia Perotis r *Portula	orea lium ra cara aca olei	gon ambig rum	guus, Aristida
	kalpari, S contorta, A Acacia Acacia Alterna Aristida Boerha Brachys	clerolaena co Perotis rara aptaneura dictyophleb nthera nanco contorta via gardner scome sp. W	ornishiana v tussock gras va a i Vanna Muni	ery open her sland.	bland and Cy Hakea la Paspalia Perotis i *Portula Pteroca	orea lium ra rara aca olei ulon se	gon ambig rum racea rrulatum	guus, Aristida
	kalpari, S contorta, A Acacia Acacia Alterna Aristida Boerhay Brachys (S. van	clerolaena co Perotis rara aptaneura dictyophleb nthera nanco a contorta via gardner scome sp. W Leeuwen 40	ornishiana v tussock gras a a i Vanna Muni 662)	ery open her sland.	bland and Cy Hakea la Paspalia Perotis r *Portula Pterocar Ptilotus	mbopog prea lium ra cara uca olea ulon se gaudic	gon ambig rum racea rrulatum haudii va	guus, Aristida
	kalpari, S contorta, A Acacia Acacia Alternat Aristida Boerhay Brachys (S. van Bulbost	clerolaena co Perotis rara aptaneura dictyophleb nthera nanca contorta via gardner scome sp. W Leeuwen 40 tylis barbatc	ornishiana v tussock gras a a i Vanna Muni 662)	ery open her sland.	bland and Cy Hakea la Paspalia Perotis i *Portula Pterocau Ptilotus Ptilotus	orea lium ra rara uca olea ulon se gaudic helipte	gon ambig rum racea rrulatum haudii va roides	guus, Aristida ar. gaudichaudii
	kalpari, S contorta, A Acacia Acacia Alternat Aristida Boerhay Brachys (S. van Bulbost	clerolaena co Perotis rara aptaneura dictyophleb nthera nanco a contorta via gardner scome sp. W Leeuwen 40	ornishiana v tussock gras a a i Vanna Muni 662)	ery open her sland.	bland and Cy Hakea la Paspalia Perotis r *Portula Pterocar Ptilotus Ptilotus Ptilotus	vmbopog prea lium ra vara aca olea ulon se gaudic helipte obovat	gon ambig rum racea rrulatum haudii va roides us subsp.	guus, Aristida
	kalpari, S contorta, A Acacia Acacia Alterna Aristida Boerhay Brachys (S. van Bulbost Cleome	clerolaena co Perotis rara aptaneura dictyophleb nthera nanca contorta via gardner scome sp. W Leeuwen 40 tylis barbatc	ornishiana v tussock gras pa i vanna Muni 662) n	ery open her sland.	bland and Cy Hakea la Paspalia Perotis r *Portula Pterocau Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus	mbopog prea lium ra rara uca olea ulon se gaudic helipte obovat polysta	gon ambig rrum racea rrulatum haudii va roides us subsp. uchyus	guus, Aristida ar. gaudichaudii
	kalpari, S contorta, A Acacia Acacia Alternat Aristida Boerhay Brachys (S. van Bulbost Cleome Cymbop	clerolaena co Perotis rara aptaneura dictyophleb nthera nanco a contorta via gardner scome sp. W Leeuwen 40 tylis barbato viscosa	ornishiana v tussock gras na i Vanna Muni 662) n guus	ery open her sland.	bland and Cy Hakea la Paspalia Perotis n *Portula Pterocan Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus	mbopog prea lium ra rara ulon se gaudic helipte obovat polysta polysta	gon ambig rum racea rrulatum haudii va roides us subsp. uchyus uchyus	guus, Aristida ar. gaudichaudii
	kalpari, S contorta, Acacia Acacia Alterna Aristida Boerhay Brachys (S. van Bulbost Cleome Cymbop Dactylo	clerolaena co Perotis rara aptaneura dictyophleb nthera nanca via gardner scome sp. W Leeuwen 40 tylis barbatco viscosa pogon ambig	ornishiana v tussock gras na i Vanna Muni 662) n guus	ery open her sland.	bland and Cy Hakea la Paspalia Perotis i *Portula Pterocan Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus Rhodant	mbopog orea lium ra cara ulon se gaudic helipte obovat polysta polysta he flor	gon ambig rum racea rrulatum haudii va roides us subsp. uchyus uchyus uchyus ibunda	guus, Aristida ar. gaudichaudii . obovatus
	kalpari, S contorta, A Acacia Acacia Alternat Aristida Boerhay Brachys (S. van Bulbost Cleome Cymbop Dactylo Dyspha	clerolaena ca Perotis rara aptaneura dictyophleb nthera nana a contorta via gardner scome sp. W Leeuwen 40 tylis barbata viscosa pogon ambig potenium rad	ornishiana v tussock gras na i Vanna Muni 662) n guus dulans	ery open her sland.	bland and Cy Hakea la Paspalia Perotis r *Portula Pterocan Ptilotus Ptilotus Ptilotus Ptilotus Rhilotus Rhodant Sclerola	mbopog orea lium ra cara ulon se gaudic helipte obovat polysta polysta he flor ena co	gon ambig rum racea rrulatum haudii va roides us subsp. uchyus ichyus ibunda rnishiana	guus, Aristida ar. gaudichaudii . obovatus
	kalpari, S contorta, Acacia Acacia Alterna Aristida Boerhay Brachys (S. van Bulbost Cleome Cymbop Dactylo Dyspha Eragros	clerolaena co Perotis rara aptaneura dictyophleb nthera nand a contorta via gardner scome sp. W Leeuwen 40 tylis barbata viscosa pogon ambig octenium rad nia kalpari stis pergrac	ornishiana v tussock gras a i vanna Muni 662) a guus dulans ilis	ery open her sland.	bland and Cy Hakea la Paspalia Perotis i *Portula Pterocan Ptilotus Ptilotus Ptilotus Ptilotus Ptilotus Rhodant Sclerola Solanum	mbopog orea lium ra cara uca olea ulon se gaudic helipte obovat polysta polysta he flor ena con a lasiop	gon ambig rum racea rrulatum haudii va roides us subsp. uchyus uchyus ibunda rnishiana hyllum	guus, Aristida ar. gaudichaudii . obovatus
	kalpari, S contorta, A Acacia Acacia Alternat Aristida Boerhay Brachys (S. van Bulbost Cleome Cymbop Dactylo Dyspha Eragros Euphor	clerolaena co Perotis rara aptaneura dictyophleb nthera nanca via gardner scome sp. W Leeuwen 40 tylis barbatco viscosa pogon ambig octenium rac nia kalpari	ornishiana v tussock gras na i Vanna Muni 662) n guus dulans ilis xa	ery open her sland. na Flats	bland and Cy Hakea la Paspalia Perotis r *Portula Pterocan Ptilotus Ptilotus Ptilotus Ptilotus Rhilotus Rhodant Sclerola	mbopog orea lium ra cara uca olea ulon se gaudic helipte obovat polysta polysta he flor ena con a lasiop	gon ambig rum racea rrulatum haudii va roides us subsp. uchyus uchyus ibunda rnishiana hyllum	guus, Aristida ar. gaudichaudii . obovatus



Dotoniat			Survey - S			Our day of	50 m 50 m
Botanist	Linda Dat		Б	Site area	NT	Quadrat 5	
Location	50K	692237 m	1E	7476823 n	nN	Elevation	i 699 m
Topography and Geology	Landform: Flat p Soil: red clay. Geology: 30% co	lain ver of BIF gravels	, pebbles and	d cobbles.			
Veg Condition		Disturbances			Land S	System	tba
Site Photo							
Vegetation		<i>a, Acacia inaequil</i> immock grassland		пеа wickna	mii sca	ttered shrut	os over <i>Trioaia</i>
Species	Abutilon dioica	1.1704		011 1			
		um		Oldenla	ındia c	rouchiana	!
	Abutilon otoca					rouchiana e muelleri	
	Abutilon otoca Acacia ancistr	rpum			urachn	e muelleri	
		nrpum ocarpa		Parane	urachn aca ole	e muelleri eracea	
	Acacia ancistr	urpum ocarpa ura		Parane *Portul	urachn aca ole calost	e muelleri eracea achyus	
	Acacia ancistr Acacia aptane	nrpum ocarpa ura ntha		Paranes *Portul Ptilotus Ptilotus	urachn aca ole calost helipt	e muelleri eracea achyus	
	Acacia ancistr Acacia aptane Acacia elacha	urpum ocarpa ura ntha ilatera		Paranes *Portul Ptilotus Ptilotus	urachn aca old calost helipt obova	e muelleri eracea tachyus eroides utus subsp.	
	Acacia ancistr Acacia aptane Acacia elacha Acacia inaequ	nrpum ocarpa ura ntha ilatera nana		Paranes *Portul Ptilotus Ptilotus Ptilotus Schizac	urachn aca ole calost helipt obova hyrium	e muelleri eracea fachyus eroides utus subsp. n fragile	
	Acacia ancistr Acacia aptane Acacia elacha Acacia inaequ Alternanthera	rrpum ocarpa ura ntha ilatera nana rta		Paranes *Portul Ptilotus Ptilotus Schizac Senna a	urachn aca ole calost helipt obova hyrium	e muelleri eracea fachyus eroides utus subsp. n fragile	obovatus sp. oligophylla
	Acacia ancistr Acacia aptane Acacia elacha Acacia inaequ Alternanthera Aristida conto	rrpum ocarpa ura ntha ilatera nana rta dneri		Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna g Senna n	urachn aca old calost helipt obova hyrium rtemis clutinos	e muelleri eracea achyus eroides tus subsp. tragile ioides sub sa subsp. g is	obovatus sp. oligophylla glutinosa
	Acacia ancistr Acacia aptane Acacia elachar Acacia inaequ Alternanthera Aristida contor Boerhavia gar	urpum ocarpa ura ntha ilatera nana rta dneri udinostachya		Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna g Senna r Sida ?sj	urachn aca old calost helipt obova hyriun rtemis clutinos cotabili o. Supp	e muelleri eracea achyus eroides tus subsp. a fragile ioides sub sa subsp. g is blejack Sta	obovatus sp. oligophylla glutinosa
	Acacia ancistr Acacia aptane Acacia elachar Acacia inaequ Alternanthera Aristida contor Boerhavia gar Dysphania rha Eremophila lo	urpum ocarpa ura ntha ilatera nana rta dneri udinostachya	icalyx	Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna a Senna r Sida ?sj Hensha	urachn aca old calost helipt obova hyrium trtemis dutinos cotabili o. Supp all 234:	e muelleri eracea fachyus eroides tus subsp. fragile ioides sub sa subsp. g is blejack Sta 5)	obovatus sp. oligophylla glutinosa
	Acacia ancistr Acacia aptane Acacia elachar Acacia inaequ Alternanthera Aristida contor Boerhavia gar Dysphania rha Eremophila lo	nrpum ocarpa ura ntha ilatera nana rta dneri udinostachya ngifolia noides var. villos	icalyx	Paranes *Portul Ptilotus Ptilotus Schizac Senna g Senna g Senna n Sida ?sj Hensha	urachn aca old calost helipt obova hyriun stemis stutinos statinos	e muelleri eracea fachyus eroides etus subsp. a fragile ioides sub sa subsp. g is blejack Sta 5)	obovatus sp. oligophylla glutinosa
	Acacia ancistr Acacia aptane Acacia elachan Acacia inaequ Alternanthera Aristida conto Boerhavia gar Dysphania rha Eremophila lo Evolvulus alsin	rrpum ocarpa ura ntha ilatera nana rta dneri idinostachya ngifolia noides var. villos bsiana	icalyx	Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna a Sida ?sj Hensha Sida ara	urachn aca old calost helipt obova hyrium trtemis tutinos cotabili o. Supp ill 234: enicola austra	e muelleri eracea fachyus eroides tus subsp. a fragile ioides sub sa subsp. g is blejack Sta 5) u lianus	obovatus sp. oligophylla glutinosa tion (T.S.
	Acacia ancistr Acacia aptane Acacia elachar Acacia inaequ Alternanthera Aristida contor Boerhavia gar Dysphania rha Eremophila lo Evolvulus alsin Goodenia stob	rrpum ocarpa ura ntha ilatera nana rta dneri idinostachya ngifolia noides var. villos bsiana	icalyx	Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna a Senna r Sida ?s Hensha Sida ara Sida ara Tragus Trianth	urachn aca old calost helipt obova hyrium tremis clutinos cotabili o. Supp all 234: enicola austra ema gl	e muelleri eracea fachyus eroides tus subsp. fragile ioides sub sa subsp. g is blejack Sta 5) t lianus	obovatus sp. oligophylla glutinosa tion (T.S.
	Acacia ancistr Acacia aptane Acacia elachan Acacia inaequ Alternanthera Aristida conto Boerhavia gar Dysphania rha Eremophila lo Evolvulus alsin Goodenia stob Grevillea wick	rrpum ocarpa ura ntha ilatera nana rta dneri idinostachya ngifolia noides var. villos bsiana hamii	icalyx	Paranes *Portul Ptilotus Ptilotus Schizac Senna a Senna a Sida ?sj Hensha Sida ara	urachn aca old calost helipt obova hyrium trtemis tutinos totabili o. Supp 11 234: enicola austra ema gl ?brizo	e muelleri eracea fachyus eroides tus subsp. fragile ioides sub sa subsp. g s blejack Sta 5) f lianus ossostigma bides	obovatus sp. oligophylla glutinosa tion (T.S.



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