

Baseline Vegetation Survey

Hill 50 Gold N.L.

Mt Magnet, Western Australia

(Preliminary Report)

Prepared for:

Western Mining
Corporation
Hill 50 Gold N.L.
Mt Magnet Operations

By:

G & T Cockerton
Landcare Services
YORK WA 6302

March 1995

(revised 27th May 2003)

Table of Contents

1.0. INTRODUCTION	2
2.0 METHODS.....	2
2.1 FLORA SURVEY	2
TERMINOLOGY	3
2.2. VEGETATION SURVEY	3
2.2.1. <i>Site Selection</i>	3
2.2.2 <i>Plot Design</i>	9
3.0 RESULTS AND DISCUSSION	10
3.1 FLORISTIC EVALUATION	10
3.1.1 <i>Species Recorded</i>	10
<i>Mulga - The Dominant Upper Storey</i>	12
<i>Understorey</i>	14
3.1.2 <i>Rare and Priority Flora</i>	15
3.1.3 <i>Aboriginal Uses</i>	19
3.1.4 <i>Weed Species</i>	19
3.2 <i>Vegetation Evaluation</i>	19
SPECIES DIVERSITY	22
<i>Species Distributions</i>	22
<i>Vegetation Composition and Structure</i>	22
SUMMARY	23
ACKNOWLEDGMENTS	25
SITE 1: EAST WANDERRIE	30
SITE 2: THE GRANITES - SOUTH.....	33
SITE 3: MT. WARRAMBOO.....	37
SITE 4: BOOMER - SOUTH	40
SITE 5: FRANKS TOWER.....	43
SITE 6: MAYFLOWER.....	46
SITE 7: JASPILITE CREEK	49
SITE 8: JASPILITE - QUARTZ PLAIN.....	53
OPPORTUNISTIC SITE : LATERITIZED PLATEAU ADJACENT TO EAST WANDERRIE	56
OPPORTUNISTIC SITE : SUCCESS HILL.....	58
APPENDIX 4 SPECIES LOCATION SPREADSHEET.....	70

APPENDIX 5 GENERAL SITE DESCRIPTIONS	75
APPENDIX 6 SUMMARISED STATISTICS FOR NATURAL VEGETATION MONITORING SITES.....	77
G.P.S. LOCATIONS FOR OCTOBER 1994 VEGETATION MONITORING SITES (AGD 84)..	79
CORRIGENDA.....	80

Baseline Flora and Vegetation Surveys - Hill 50 N.L. LeasesMt Magnet, WA.Phase 1 Oct 1994 - March 1995

Executive Summary

As part of Western Mining Corporation's Hill 50 Gold N.L. Mt Magnet Operations overall environmental management plan, a baseline vegetation survey of Hill 50 lease areas was commissioned in late 1994. Aims of the initial project included commencement of the compilation of an extensive species list and herbarium and broad characterisation of vegetation map units occurring on Hill 50 N.L. lease areas.

An initial 18 day field trip was conducted from 4th to 21st October 1994 resulting in the collection of 287 plant specimens providing 207 species and/or varieties of indigenous flora from an area of approximately 140 square km. Several priority taxa and one declared rare and endangered species were identified in the study, none of which appear under immediate threat from either current or proposed near-future mining operations. One recently described taxon *Alyxia tetanifolia* Cranfield was found, with the only other known populations of this species occurring near WMC's Kambalda Nickel Smelter (Cranfield 1995).

Characterisation of the vegetation map units, delineated using satellite imagery, closely followed the recently published land unit classifications used by the Department of Agriculture in their assessment of the Murchison River Catchment (Curry, Payne, Leighton, Hennig and Blood, 1994) and gives a detailed though broadly based profile of each vegetation unit.

The methodology undertaken here provides the basis for further, more intensive sampling programs to more accurately characterise vegetation map units within Hill 50 N.L. lease areas with a view to producing a detailed vegetation map and complete species list for the area over the next 4 to 5 years.

Geoff Cockerton B.Sc.

1.0. Introduction

As part of Western Mining Corporation's Hill 50 Gold N.L. Mt Magnet Operations overall environmental management plan, a baseline vegetation survey of Hill 50 lease areas was commissioned in late 1994. Aims of the initial project included (i) commencement of the compilation of an extensive species list and herbarium and (ii) to broadly characterise each of the vegetation map units (q.v.) occurring on Hill 50 N.L. lease areas.

Mt Magnet lies in the south-western extreme of the Wiluna sub-region of the Austin Botanical District, within the Eremaean Botanical Province and is located approximately 500 Km north-east of Perth, Western Australia. Fig 1. The study area ranges 6.25 km south-west, 5 km east and 12.5 km north of Mt Magnet and has an area of approximately 140 sq km. Altitude at the Mt Magnet Post Office is 426m.

Climate of the area is regarded as arid with a mean annual rainfall of 236mm. There is a pronounced twin-peak rainfall distribution with maximum rainfall events occurring in late summer (February) due to seasonal thunderstorms and then again in mid-winter (June) with prevailing anti cyclonic weather patterns. Temperatures range from mean minima of 6.6°C in July with many frosts to mean maxima of around 38°C in January. (data courtesy of Bureau of Meteorology W.A.) Figs. 2 & 3.

The broad vegetation classification of the immediate Mt Magnet area following Beard (1976) mapped at 1:1,000,000 is that of (i) mulga low woodland and (ii) areas of succulent steppe consisting of mulga with saltbush and bluebush understoreys. More recently the W.A. Department of Agriculture has published an inventory and condition survey of the Murchison River Catchment at a scale of 1:250,000 Curry *et al* (1994), which better describes the land systems and vegetation units of the area. Terminology of Curry *et al* (1994) has been adopted here for describing land units encountered in this project and reflects the overriding pastoral nature of land use within the district.

2.0 Methods

2.1 Flora Survey

A series of detailed opportunistic collections were made during the first week of the project. These were made both (i) at specific sites, approximating the vegetation monitoring sites determined earlier, as directed by Mike Emrose and Trevor McKenzie of Hill 50 and (ii) as part of our general travel in and around Mt Magnet and the Hill 50 lease areas. This technique resulted in sampling around 80% of all species encountered in this phase of the project and also served as a site familiarisation process for ourselves. Further collections were made as sites were visited for purposes of plot establishment and data collection for the vegetation survey.

Detailed notes were kept for the majority of samples collected, including latitude and longitude or Australian Mapping Grid (AMG) references determined by global positioning system (GPS). Four samples were taken of each specimen, plant material

availability permitting. One sample was retained for reference by Landcare Services, one sample for the Hill 50 reference herbarium, one sample for the Hill 50 field herbarium and one sample to be lodged with the W.A. Herbarium. Additional copies were taken in some cases, eg: *Acacia* sp. "Gizzard Wattle" which is as yet an undescribed species and *Alyxia tetanifolia* Cranfield, which is a recently described species. Our collections of the latter represented a new and disjunct population. Multiple copies of these specimens were lodged with the W.A. Herbarium.

Samples were then identified over a three week period at the W.A. Herbarium by Mr G. Cockerton, Mrs T. Cockerton and Mr A. Crawford, with assistance from the following botanists: Mr Ray Cranfield, Dr Bruce Maslin (*Acacia* spp.), Ms Sue Patrick, Mr Malcolm Trudgeon and Mr Paul Wilson (CHENOPODIACEAE). Their invaluable assistance is acknowledged and greatly appreciated.

As there have been few systematic collections made in the Mt Magnet area (Beard 1976), the most comprehensive collections being the inventory condition surveys made by the W.A. Department of Agriculture (1985-88) and reported in Cranfield (1990) and Curry *et al* (1994) within the Murchison catchment, the local flora is not well known in other than a general sense.

Terminology

Terminology is constantly evolving in taxonomic fields and there have been several significant revisions of major groups. The most notable of these are the recent works by Randell (1989) on the *Cassia/Senna* (CAESALPINIACEAE) groups and Randell (1992) on the Mulga group (*Acacia* spp., MIMOSACEAE) of inland Australia. There has also been a recent major revision of the *Eremophila* group (MYOPORACEAE) (Plate 1) by R. Chinnock (unpubl.), State Herbarium - Botanic Gardens of Adelaide, which has led to a further approx 80 species being described, including many varieties occurring at Mt Magnet (R Chinnock, pers. comm.). Dr Bruce Maslin (WA Herbarium) is also conducting a major revision of *Acacia* throughout Australia and has particular interest in many of the varieties in the Mt Magnet area, with several new species yet to be described in this region. Taxonomic terminology in this report is as up to date as possible, with the previously noted recent revisions being used.

Terminology of Curry *et al* (1994) has been used in describing landforms and soils while foliar cover has been described using terminology of Curry *et al* (1983). Both these are now the currently adopted standard for pastoral regions in the Murchison district. Vegetation structure descriptions follow McDonald, Isbell, Speight, Walker and Hopkins (1990).

Locations of major specimen collection sites are noted in Table 1.

2.2. Vegetation Survey

2.2.1. Site Selection

Vegetation survey points were chosen from within broadly similar false colour matched regions from 1:25,000 Landsat TM Vegetation Ratio satellite image of the Hill 50 N.L. lease areas. These were provided by Mr Trevor McKenzie of Hill 50 Gold N.L. Areas of similar intensity and shade of colour were sampled at three spatially separated sites, each sampling site having a total area of 500 sqm.

Sites chosen are outlined in Table 2 and are also marked on Plate 2. The aim of this method of site selection was to validate that the Landsat false colour image was a useful tool in defining vegetation categories and to assess these vegetation units for their floristic and structural composition. Areas defined by this technique are referred to as Vegetation Map Units (VMU) rather than "communities" or "associations" as the latter tend to infer a greater degree of ecological and species homogeneity than is possible to describe at this stage.

Plate 1. *Eremophila mackinlayi* ssp. *spathulata*; a spectacular species from near a major creekline, bore PB6.

Figure 1: Location Map
(Blackall and Grieve 1988 [p29])

Figure 2: Rainfall and Raindays.

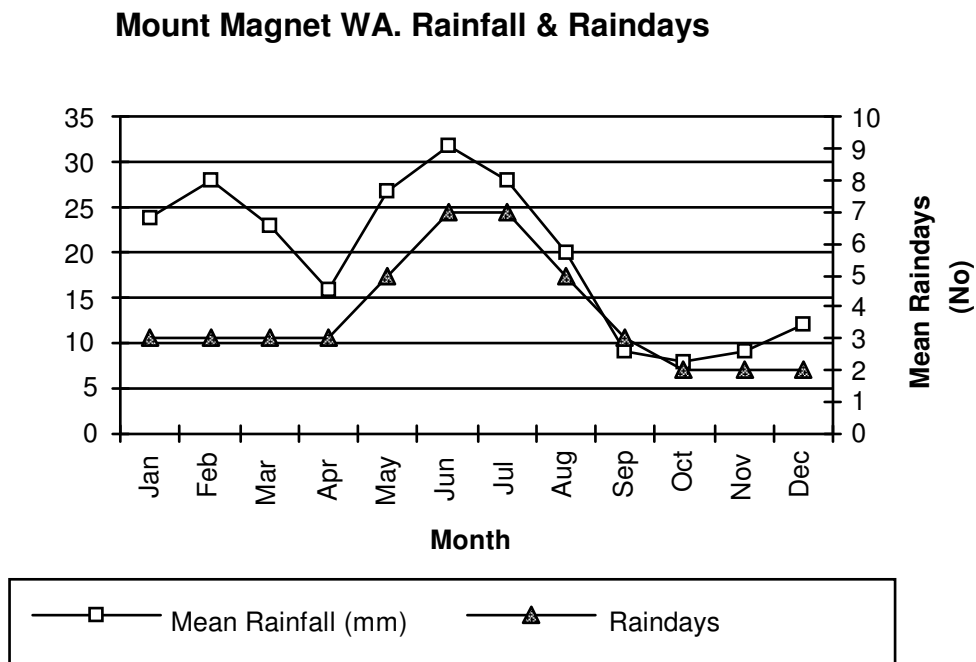


Figure 3: Mean Maximum and Minimum Temperatures

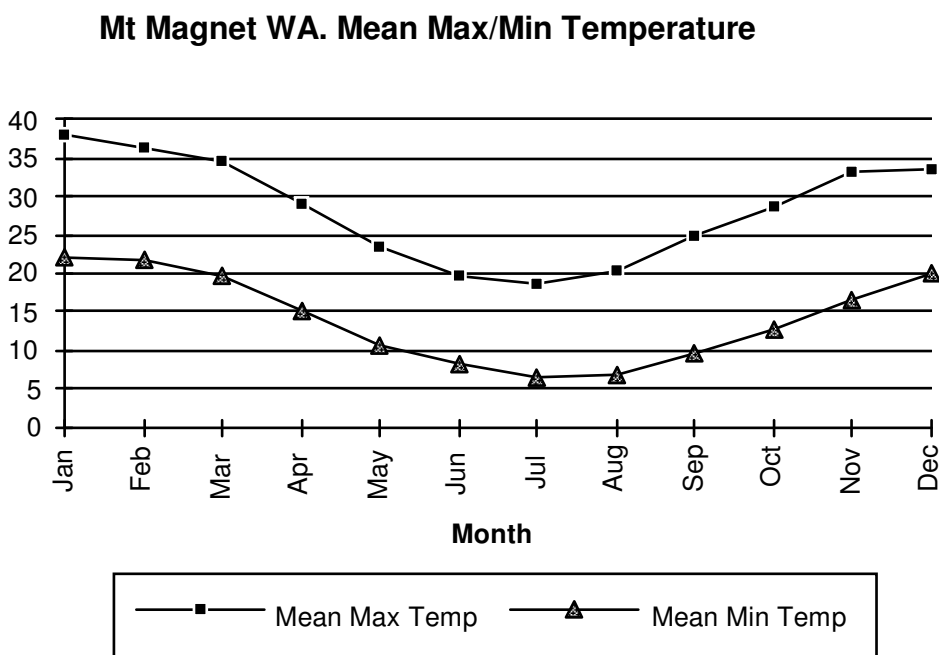


Plate 2. Landsat false colour vegetation ratio map showing relative positions of the 8 native vegetation sampling sites and site 9, a rehabilitated waste rock dump. Cadastral overlay of Hill 50 lease areas.

Table 1: Flora Survey - Major Locations

Name	Generalized Location
East Wanderrrie and Lateritized Plateau	6.75 Km north-east of Mt Magnet
The Granites South	5 Km north-east of Mt Magnet
Mayflower	3 Km east of Mt Magnet
Boomer South and Frank's Tower	Approx 4.25 and 6.25 km west of Mt Magnet respectively
Jaspilite	8.5 Km north-west of Mt Magnet
Baxters/Success Hill	13 Km north of Mt Magnet

Table 2: Natural Vegetation Map and their corresponding Landsat map false colours. See also Plate 2

Vegetation map unit - number and name	Landsat map false colour
1. East Wanderrrie	pale red, mottled, extensive areas
2. The Granites - South	very pale red with cream & blue striations, extensive areas
3. Mt Warrambo	dark green-black, difficult to distinguish, extensive areas
4. Boomer	dark red, narrow bands
5. Franks Tower	dark blue-green, extensive areas
6. Mayflower	blue, mottled pink, extensive areas
7. Jaspilite Creekline	dark red, narrow bands
8. Jaspilite Quartzite Plain	blue, small pockets

2.2.2 Plot Design

The technique of vegetation survey developed for this project was arrived at after some initial consternation and experimentation with plot design in the field. To characterise the vegetation at each site chosen for study, estimates of both percentage cover and

abundance were obviously required. None of the scales of estimating vegetation cover outlined by Causton (1988) were deemed acceptable for this project at this stage and an visual estimate of total projected cover (TPC) and abundance of each species was made at each site.

Three spatially separated sample site replicates, each consisting of five contiguous 10m x 10m quadrats aligned in an east-west direction, were made within each vegetation map unit. A steel datum peg was placed in the north-east corner of each sample site which also served as a photographic reference point.

These measurements were then further refined after the first sampling procedure to measure abundance and TPC of each species within four height categories (Table 3). This enabled a vegetation density vs stratum profile of each site, except East Wanderrie, to be generated for comparison (Appendix 1).

The densities of vegetation at various strata were deemed of great significance to the fauna of the region after discussions with zoological consultants Mr Darren Murphy (now with Western Mining Corp. Kambalda), who had recently conducted faunal surveys of the Hill 50 lease areas. These were included in our sampling methodology when it was apparent that we were able to make sufficient progress to enable their inclusion in the field work for this preliminary report.

Soil samples (0 - 10cm) were taken at each vegetation monitoring site for analysis of pH, E.C. and gravel content.

Photographic records of the majority of species and all of the vegetation monitoring sites were kept and are presented separately.

3.0 Results and Discussion

3.1 Floristic Evaluation

3.1.1 Species Recorded

The number of species encountered during preparation of this report was limited by three factors:

- (i) Time availability for opportunistic investigation of habitats outside the vegetation monitoring sites. The majority of species outside the vegetation monitoring plots were recorded in opportunistic collections of this nature.
- (ii) the general paucity of annual species in response to a very dry year to date (128 mm Jan - Dec 1994).

- (iii) Time of year (October 1994) for the field component of this report. Most species had finished flowering by this stage and many cryptic species eg: *Eremophila* spp., *Grevillea* spp. were impossible to differentiate based on vegetative material alone. Future specimen collections should also be .

Table 3: Vegetation stratum categories
(As applied at sites 2 to 9 for the vegetation survey)

Stratum	Height range
1	0 - 0.25m
2	0.25m - 1.0m
3	1.0m - 2.0m
4	> 2.0m

Plate 3. Vegetation monitoring at East Wanderrrie. Note string line delineation of 10m x 10m quadrats

conducted earlier in spring (Aug-Sept) to obtain flowering material of annuals and the majority of perennial species present

Two hundred and six (206) endemic species of vascular plants (mostly perennials) were recorded in this project representing 73 genera and 36 families from an area of approx 140 sq km. Weed species were not recorded specifically although one species *Rumex vesicarius* L. (POLYGONIACEAE) is noted in the species list. A complete systematic species list is attached in Appendix 2. This baseline survey therefore ranks well with that of Cranfield (1990) which noted 823 species from the Murchison Catchment Survey area of 85,000 sq km. While there have been some changes in taxonomic terminology, many species noted in this report were not represented in the Murchison Catchment Survey area report. Furthermore, not all specimens have as yet been identified to species level due to either lack of suitable material or difficulties in matching specimens to curated specimens at the WA Herbarium. It is possible that several as yet undescribed species have been collected.

Mulga - The Dominant Upper Storey

The most common upper storey and dominating vegetation of the region is Mulga, which comprises a suite of *Acacia* species and includes the following: *Acacia aneura* var. *aneura* (Plate 4), *A. aneura* var. *conifera*, *A. aneura* var. *macrocarpa* and *Acacia ayersiana*. Randell (1992). There was a great deal of confusion in the field regarding distinction between the various phenotypes of *A. aneura* and it was not until much time was spent at the W.A. Herbarium that the works of Randell and comments made by Bruce Maslin began to make sense. There is still some disagreement between Randell and Maslin as to the demarcation between the taxonomic groups within *A. aneura* (Maslin pers. comm.) and it's allies however the work of Randell has been followed here. Three groups within *A. aneura* have been noted in the species list. The *A. aneura* - unspecified sub species is a collection of variable phenotypes that cannot be determined to subspecies level without fruiting material. *A. aneura* var. *macrocarpa* probably exists in the region, however again, without mature fruits, it is not possible to distinguish.

Furthermore, much of what is locally called *A. aneura* is actually *A. ayersiana* var. *latifolia*, the distinguishing character being the width of the phyllode. *A. aneura* in all it's forms has a narrow phyllode (< 3mm) while that of *A. ayersiana* var. *latifolia* is wider (> 3mm).

Other dominating *Acacia* spp. include *A. craspedocarpa* (Hop Mulga), *A. coolgardiensis* ssp. *effusa*, *A. ramulosa* (Bowgada) and *A. tetragonophylla* (Kurara). There are other occurrences of *Acacia* species, often in limited populations, and usually in conjunction with the dominant species. See Appendix 1 and Appendix 2.

Two as yet undescribed species were collected: *Acacia* sp. "Diorite " and *Acacia* sp. "Gizzard". Both these are currently being described by Bruce Maslin. A further species (sp. LCS-97) did not have sufficient material for a positive identification however is definitely a different species to those recorded. *Acacia* aff. *quadrimarginea* is reportedly different to the type of *A. quadrimarginea* and this group is under revision. (B. Maslin

pers. comm.) *Acacia kalgoorliensis* MS. was also located at two sites. In total, 30 species of *Acacia* were recorded.

Understorey

The understorey species encountered showed a great deal of diversity and varied from halophytic chenopod shrublands to xerophytic *Eremophila* dominated shrublands, either with or without an overstorey of *Acacia* sp..

Plate 4: *Acacia aneura* var. *aneura* near a major creekline, Bore PB6.

29 species of endemic Chenopods were noted, with a further 7 species only found on the rehabilitated Jaspilite waste rock dump. There appears to be some degree of hybridisation among many members of this group eg: *Maireana georgei* x *Enchylaena tomentosa*; *M. trichoptera*, which makes identification somewhat difficult. It is also likely that *Maireana tomentosa* #225 is an as yet undescribed species.

In total, 29 species of MYOPORACEAE were recorded, one *Bursaria* (*B. occidentalis*) and 28 *Eremophila* spp.. Identification of the *Eremophila* spp. required far more time than expected due to the lack of flowering material and the revision of *Eremophila* currently being undertaken and soon to be published by Chinnock.

Senna spp. were classified following Randell (1989). This group seems to display a great deal of variation in form and the recent revision has reduced many species of the former genus *Cassia* to sub species of two species, namely *S. artemisioides* and *S. glutinosa*. The formerly recognised species of *Cassia desolata* (Mitchell & Wilcox 1994), which is very common at Mt Magnet, has been reduced to *Senna artemisioides* ssp *X sturtii*. Field identification of the many sub-species requires a great deal of care and preferably reference samples with which to compare.

A paucity of annuals reflected the dry conditions of 1994, with only 5 annual ASTERACEAE, 1 annual AIZOACEAE, 5 AMARANTHACEAE (*Ptilotus*) and 14 annual Chenopods (*Atriplex*, *Maireana* and *Sclerolaena* spp. [Plate 5]) were recorded.

3.1.2 Rare and Priority Flora

One declared rare flora taxon (DRF), three priority taxa and 1 proposed priority taxon were found. None of these populations appear to be threatened by either current or near-future mining activities.

- <i>Calytrix erosipetala</i> (MYRTACEAE)	Priority 3	< 100 plants
- <i>Leucopogon</i> sp. LCS-86 aff. <i>breviflorus</i> (EPACRIDACEAE)	Priority 3	23 plants
- <i>Prostanthera magnifica</i> (LAMIACEAE)	Priority 2	7 plants
- <i>Grevillea inconspicua</i> (PROTEACEAE)	Declared Rare Flora	57 plants
- <i>Alyxia tetanifolia</i> (APOCYNACEAE)	Proposed Priority 2	140 plants

Populations of the first three species occurred within 50m of each other on the lateritized plateau and associated breakaways adjacent to the East Wanderrie vegetation monitoring site. (lat: 50J 058 7391, long: UTM 690 0242; A.M.G. approx). *G. inconspicua* was found at Success Hill (lat: 50J 057 9681, Long: UTM 691 0969 A.M.G.), some 13.75 km north of Mt Magnet, associated with a diorite hill.

The 57 mature individuals of *Grevillea inconspicua* (Plate 6) were noted as being severely grazed although there was evidence of dehisced seed pods on and under the bushes. Apparently *G. inconspicua* is widely distributed around the minesite, usually associated with exposed diorite outcrops. (T. McKenzie pers. comm.). This population

represents a range extension for this species, the nearest previously known population occurring at Cue some 70 km to the north.

A population of *Alyxia tetanifolia*, proposed category 2 priority taxon, was found at Jaspilite, mainly associated with the lateritized plateau and breakaways in the area, occasionally in drainage lines. 144 mature plants were located within the population and all were severely grazed, although they seem to have recovered well. Plants were noted as flowering on 2/2/95 and evidence of seed was found under the bushes. This species has only recently been described and had only been recorded at three sites near Kambalda, WA. This therefore represents a new and distinct population of this species within the Austin Botanical District. Two voucher specimens have been lodged with the WA Herbarium.

Plate 5: *Sclerolaena eriacantha* An annual *Sclerolaena*
(CHENOPODIACEAE)

Plate 6: *Grevillea inconspicua* (Cue Grevillea), A Declared Rare Flora taxon found at Success Hill.

Regions of the lateritized plateau, forming part of the Sherwood land system of Curry *et al* (1994), are currently known to include four priority species and are worthy of special attention and management, as are populations of *Grevillea inconspicua*. Copies of the rare flora reports submitted to C.A.L.M covering these species are attached in Appendix 3.

3.1.3 Aboriginal Uses

Seed dispersal can be affected by biotic factors such as animals, Davidson and Morton (1984) as well as physical factors such as landform, geology, soil type, hydrology etc Cranfield (1990). The traditional activities of Aboriginal people must have had a significant effect on the distribution of potential food species such as *Acacia* spp., *Eremophila* spp., *Santalum* spp..

The use of native species for food and medicinal purposes is well documented (Low 1989, Isaacs 1987, Cherikoff 1993, Urban 1990) *Acacia*, *Allocasuarina*, *Atriplex*, *Brachychiton*, *Carpobrotus*, *Chenopodium*, *Eremophila*, *Grevillea*, *Hakea*, *Marsdenia*, *Rhagodia*, *Santalum*, *Solanum* species and various grasses to name but a few are all listed as being used in various parts of Australia and all these genera are represented in the Mt Magnet area.

As evidence of the above, the vegetation monitoring site "The Granites - South" has numerous sites scattered with stone chippings, aboriginal artefacts such as grind stones used for seed crushing and namma holes (water harvesting sites) (Plate 7).

3.1.4 Weed Species

Weeds were not specifically noted however one introduced weed, Ruby Dock *Rumex vesicarius* L. (CHENOPODIACEAE) has importance for rehabilitated areas. It tends to be an invader of disturbed ground and does not appear to persist after an initial growth period of 1 to 2 years. In this way it performs a useful function in stabilising areas that would otherwise have a lesser cover in the first year after rehabilitation. (T. McKenzie pers. comm.). It is likely that other endemic chenopods can and do fulfil this niche however the potential 'nuisance value' of Ruby Dock in view of it's short term appearance in the vegetation succession may not warrant an active control program at this stage. If true endemism is desired in rehabilitation programs, this may need to be reviewed.

3.2 Vegetation Evaluation

The empirical data collected in the vegetation monitoring program, at each of the Vegetation Map Units described in Appendix 5, is limited by the sampling frequency achieved in this preliminary phase of the program. A larger sampling program will increase the number of species represented, broaden the soil types and landforms sampled and reduce errors in resulting data.

The eight natural vegetation map units studied fall into eight different land systems or sub units recognised by Curry *et al* (1994) and are broadly described in Appendix 5 and in detail in Appendix 1.

Plate 7. Aboriginal gnamma hole, Granites south.

Species Diversity

Appendix 6 contains summarised statistics for the 8 natural vegetation map units studied. It is interesting to note the relative decrease in species diversity as soil pH at sites tends to be either more acidic or more alkaline. Those with relatively neutral pH values tended to have higher diversities. Small scale differences in soils and landform directly influences species diversity. Sites such as Jaspilite, with complex relief, land forms and drainage patterns have a high overall diversity.

A species presence vs location spreadsheet has been constructed to show distribution trends between sites (Appendix 4).

Species Distributions

From Appendix 4, some basic information on the distributions of the 164 species encountered in within the vegetation monitoring quadrats can be deduced. One species *Solanum lasiophyllum*, was found to be ubiquitous. A further two species, *Ptilotus obovatus* and *Acacia tetragonophylla* were found at 7 sites. These were only missing from the East Wanderrie site. Four species were found at six sites, 2 were found at 5 sites, 6 species found at 4 sites, 14 species at 3 sites, 32 species found at 2 sites and a massive 84 species were found at only one site. The latter two categories indicating a high degree of local endemism of species in relation to specific landforms. (Table 7).

It is interesting to note that *Acacia tetragonophylla* appears to be the most widely distributed *Acacia* species (7 sites) followed closely by *Acacia aneura* var. *aneura* (6 sites). *Maireana georgei* and *M. tomentosa* were always found together while a wide range of *Eremophila* species were restricted to either 2 or 1 vegetation map units.

Vegetation Composition and Structure

The dominant vegetation of the Mt Magnet area is mulga woodland with chenopod shrublands. Mulga woodlands tend to vary in TPC from 30 to 35% in drainage channels and rocky outcrop hills to less than one percent in very scattered situations with only occasional emergent trees. The understorey tends to be dominated by chenopods and *Eremophila* spp. and varies from very scattered (TPC of around 6%) in rocky or saline areas to close (TPC of 35%) in drainage channels. The availability of run-off water, soil depth, soil pH and other soil characteristics all directly affect not only composition but also density and resulting total projected cover.

Site characterisations in Appendix 1 have photographs of representative sites within each vegetation map unit. These in conjunction with the included tables and graphs give both a visual appraisal and more detailed objective profile of vegetation at each site.

Summary

The flora and vegetation survey programs conducted from October 1994 to March 1995 have resulted in the identification and cataloguing of 206 native species and profiling 8 native vegetation map units and 1 rehabilitated waste rock dump. A further two vegetation sites were sampled as distinct units.

The completed herbaria were presented to Mr Trevor McKenzie of Hill 50 Gold N.L. in early February 1995 and contained around 200 species, with many duplicate specimens to demonstrate the phenotypic diversity found in many species. Notes accompanying the herbarium contained a complete species list as at 1/2/95 and included locations of collections. Some (few) specimens were not represented in the Hill 50 herbaria due to a lack of suitable material. A photographic herbarium has been prepared covering the majority of species encountered.

Number of sites at which species were recorded (excluding rehab.)	Number of species in this category	Notable species
8 (all sites)	1 sp.	<i>Solanum lasiophyllum</i>
7 sites	2 spp.	<i>Acacia tetragonophylla</i> and <i>Ptilotus obovatus</i>
6 sites	4 spp.	<i>Acacia aneura</i> var <i>aneura</i> , <i>Scaevola spinescens</i> , <i>Sida virgata</i> and perennial grasses
5 sites	2 spp.	<i>Maireana carnos</i> , <i>M. pyramidata</i>
4 sites	6 spp.	<i>Acacia aneura</i> , <i>Atriplex codonocarpa</i> , <i>Maireana thesioides</i> , <i>M. triptera</i> , <i>Ptilotus exaltatus</i> and <i>P. schwartzii</i> .
3 sites	14 spp.	<i>Acacia rhodophloia</i> , <i>A. ramulosa</i> , <i>Brachychiton gregorii</i> , <i>Maireana georgei</i> and <i>M. tomentosa</i> .
2 sites	32 spp	<i>Acacia ayersiana</i> , <i>A. masliniana</i> , <i>A. kalgoorliensis</i> MS, a range of <i>Eremophila</i> spp. and <i>Ptilotus polakii</i> .
1 site	84 spp.	<i>Acacia aulacophylla</i> MS, <i>A. acuminata</i> , <i>A. murrayana</i> , <i>Alyxia tetanifolia</i> , a range of <i>Eremophila</i> spp. and <i>Sida</i> spp.

Table 4. Species Distributions within the 8 vegetation map units.

Production of a vegetation map has been limited to noting 8 specific vegetation sampling sites, representing broadly similar vegetation map units as depicted on a 1:25,000 false colour Landsat TM image of the area. Further sampling and the use of aerial photos will enable a detailed vegetation map to be produced in the future.

The flora of Mt Magnet, Hill 50 Gold N.L. lease areas in particular, is very diverse with a predominance of Mulga (*Acacia* spp.) overlying a mixed understorey of Chenopods and *Eremophila* spp..

Four priority taxa and one declared rare flora taxon were encountered and it is likely that several as yet undescribed varieties have been collected. Annuals were not well represented in this initial flora sampling program due to 1994 being a low rainfall year.

The process of identifying flora specimens collected during the field phase of the project required far more time than we had anticipated, mainly due to difficulties in identifying species from an area that is relatively poorly represented in collections at the WA Herbarium.

Personnel involved in this project were:

Mr Geoff Cockerton B.Sc.	Principal Botanist
Mr Andrew Crawford B.Sc. Hons.	Assistant Botanist
Mrs Tracy Cockerton	Assistant Botanist

Acknowledgments

I would like to thank the following personnel for their generous assistance and support throughout the project. Mr Trevor McKenzie and Mr Mike Emrose of Hill 50 Gold N.L., Mr Ray Cranfield, Dr Bruce Maslin, Ms Sue Patrick and Mr Chang Sha Fang of the WA Herbarium, Mr Paul Wilson and Mr Malcolm Trudgeon, independent consultants.

Yours faithfully

Geoff Cockerton B.Sc.

Bibliography

- Anon. (1995) Mount Magnet Operations environmental handbook. Western Mining Corporation Ltd, Hill 50 Gold N.L.
- Beard, J.S. (1990) Plant life of Western Australia. Kangaroo Press, Kenthurst, NSW.
- Beard, J.S. (1976) Vegetation survey of Western Australia. Murchison. 1:1000,000 Vegetation Series. UWA Press, Perth.
- Blackall, W.E. & B.J. Grieve (1978) How to know Western Australian Wildflowers. Parts I, II, III. UWA Press. Perth.
- Blackall, W.E. & B.J. Grieve (1988) How to know Western Australian Wildflowers Part I. UWA Press. Perth.
- Blackall, W.E. & B.J. Grieve (1980) How to know Western Australian Wildflowers. Part IIIA. UWA Press. Perth.
- Blackall, W.E. & B.J. Grieve (1981) How to know Western Australian Wildflowers. Part IIIB. UWA Press. Perth.
- Brooker, M.I.H. and D.A. Kleinig (1990) Field Guide to Eucalypts Vol 2. Inkata Press, Melbourne.
- Burbidge, N.T. (1982) *Vittadinia*.. *Brunonia*, 5(1): 8-9, 17-18, 28-30.
- Causton, D.R. (1988) Introduction to vegetation analysis. Unwin Hyman Ltd, London.
- Cherikoff, V. (1993) The Bushfood Handbook. Bush Tucker Supply Australia Pty Ltd, Sydney.
- Cranfield, R.J. (1990) List of vascular plants recorded from the Murchison Catchment Survey area 1985-1988. *Kingia* 1(4): 327-347.
- Cranfield, R.J. (1995) *Alyxia tetanifolia* (APOCYNACEAE), a new species from south-west Western Australia. *Nuytsia* 10(1): 103-105.
- Curry, P., A. Payne and D Wilcox (1983) Suggested descriptive terms for classes of foliar cover in arid zone shrublands. Rangeland Management Newsletter, September, Australian Rangeland Society.
- Curry, P., A.L. Payne, K.A. Leighton, P. Henning, and D.A. Blood (1994) An inventory and condition survey of the Murchison River catchment, Western Australia. Technical Bulletin No. 84. Department of Agriculture, South Perth.

- Davidson, D.W. and S.R. Morton (1984) Dispersal adaptations of some *Acacia* species in the Australian Arid Zone. *Ecology*, 65(4): 1038-1051.
- Erickson, R., A.S. George, N.G. Marchant and M.K. Morcombe (1988) Flowers and plants of Western Australia. Reed. Frenchies Forest, NSW.
- Gardner, C.A. and H.W. Bennetts (1956) *The Toxic Plants of Western Australia*. W.A. Newspapers Ltd. Perth.
- Green, J.W. (1985) Census of vascular plants of Western Australia. WA Herbarium, Department of Agriculture. Perth.
- Grieve, B.J. and W.E. Blackall (1982) How to know Western Australian Wildflowers Part IV. UWA Press, Perth.
- Hopper, S., S. Van Leeuwen, A. Brown and S. Patrick (1990) Western Australia's Endangered Flora. Department of Conservation and Land Management. Perth.
- Isacs, J. (1994) *Bush Food: Aboriginal Food and Herbal Medicine*. Lansdowne Publishing Pty Ltd, Sydney.
- Johnson, R.W. & W.H. Burrows (1981) *Acacia* open-forests, woodlands and shrublands. in R.H. Groves (ed.) (1981) *Australian Vegetation*. Cambridge University Press, London.
- Hall, N.J., N.L. McKenzie and G.J. Keighery (1994) The biological survey of the Eastern Goldfields of Western Australia. Part 10. Sandstone - Sir Samuel and Laverton - Leonora Study Areas. Records of the Western Australian Museum Supplement No. 47.
- Leigh, J. (1981) Chenopod Shrublands. in R.H. Groves (ed.) (1981) *Australian Vegetation*. Cambridge University Press, London.
- Low, T. (1989) *Bush Tucker*. Angus & Robertson, Sydney.
- Maslin, B.R. and L. Pedley (1982) The distribution of *Acacia* (Leguminosae; Mimosoideae) in Australia. Part 1. Western Australian Research Notes. W.A. Department of Agriculture, Perth.
- Mattiske, E.M. & Associates (1993) Vegetation descriptions for vertebrate fauna sampling sites. Western Mining Corporation - Mt Magnet. Consultants report for Hill 50 Gold N.L.
- Mitchell, A.A. and D.G. Wilcox (1988) *Arid Shrubland Plants of Western Australia*. UWA Press. Perth.
- Mitchell, A.A. and D.G. Wilcox (1994) *Arid Shrubland Plants of Western Australia*. UWA Press. Perth.

- McDonald, R.C., R.F. Isbell, J.G. Speight, J. Walker and M.S. Hopkins (1990) Australian soil and land survey. Field handbook. Inkata Press, Sydney.
- Muir, B.G. (1977) Biological Survey of the Western Australian Wheatbelt. Part 2: Vegetation of Bendering Reserve. Records of the Western Australian Museum, Supplement No. 3.
- Randell, B.R. (1989) Revision of the CASSINAE* in Australia. 2. Senna Miller Sect. Psilorhegma (J. Vogel) Irwin and Barneby. J. Adelaide Bot Gard. 12(2): 165-272.
- Randell, B.R. (1992) Mulga. A revision of the major species. J. Adelaide Bot. Gard. 14(2): 105-132.
- Urban, A. (1993) Wildflowers & Plants of Central Australia. Portside Editions Pty Ltd, Fishermans Bend, Victoria.

Appendix 1

Site Profiles and Photographs

Site 1: East Wanderrrie

Land System: Kalli Unit 2, after Curry *et al* (1994).

Soil Description: Wanderrrie sand, pH 4.8, 0.4% > 2mm, mostly organic material.

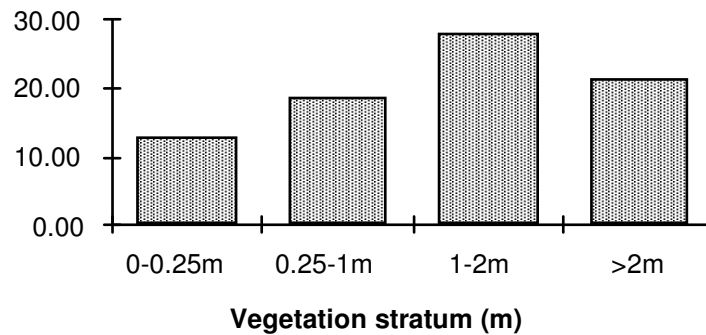
Summary Vegetation Profile

Moderately close sandplain *Acacia* shrubland over a sparse dominantly grass and *Eremophila* understorey. 15.71% cover dead material.

(Note: Approximations only; vegetation abundance and TPC vs stratum data not collected in the field)

Stratum	Mean % cover at each stratum
>2m	21
1-2m	28
0.25-1m	18
0-0.25m	12
Total	44

Total approximate % cover of each vegetation stratum at Site 1



Major Vegetation Components:

Upper storey:

Open low mulga (*Acacia coolgardiensis* ssp. *effusa*, *A. jamesiana* with occasional *A. aneura*) woodland with scattered *Grevillea stenobotrya*.

Total Projected Cover (TPC) of approx 22% with an abundance of 260 stems/ha.

Mid Storey:

Consisting of *Acacia ramulosa* 1.5 to 2m high. and *Grevillea stenobotrya* TPC of approx 28%, 146 stems/ha.

Understorey:

Total TPC of 12.52% , 11140 stems per ha, primarily *E. granitica* (high # seedlings found) and *Maireana thesioides* and perennial grasses consisting of *Eragrostis eriopoda* and *E. setifolia* which were both present in large numbers.

Species List:

Species	Abundance Stems/Ha	Total Projected Cover (%)
<i>Acacia aneura</i>	60.00	0.07
<i>Acacia coolgardiensis</i>	86.67	12.30
<i>Acacia jamesiana</i>	53.33	5.07
<i>Acacia murrayana</i>	13.33	0.60
<i>Acacia ramulosa</i>	100.00	9.93
<i>Amperea</i> sp. 204	33.33	0.12
<i>Dianella revoluta</i>	80.00	0.05
<i>Eremophila forresti</i>	86.67	0.75
<i>Eremophila granitica</i>	8160.00	5.55
<i>Eremophila</i> sp. 203	246.67	2.22
<i>Eremophila</i> sp. 207	6.67	0.07
<i>Grevillea stenobotrya</i>	46.67	3.68
<i>Maireana thesioides</i>	2406.67	0.22
Perennial grasses	31660.00	3.00
<i>Scaevola spinescens</i>	6.67	0.02
<i>Sida virgata</i>	86.67	0.47
<i>Solanum lasiophyllum</i>	26.67	0.05
Total 17 species	43,160/ha	44.15%

Vegetation at East Wanderrie (Site 1A)

Site 2: The Granites - South

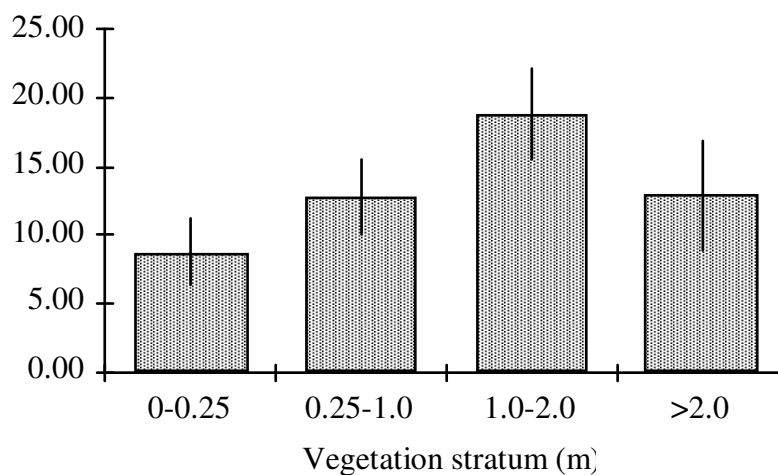
Land System: Austin Unit 3, after Curry *et al* (1994)
 Soil Description: Hardpan loamy sand with occasional emergent massive granite rocks. pH 6.4, 7.1% >2mm, 0.2% cover Bare rock

Summary Vegetation Profile

Scattered mulga woodland (*Acacia craspedocarpa* with *A. aneura* var. *aneura*. *A. eremaea*, *A. grasbyi* & *A. tetragonophylla*) over a scattered predominantly chenopod understorey. 1.59% cover dead material.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	8.76	2.43
0.25 - 1.0m	12.71	2.70
1.0 - 2.0m	18.78	3.34
> 2.0m	12.93	3.96
Total	31.02	6.00

Total percentage cover of each vegetation stratum at site 2:



Major Vegetation Components:

Upper storey:

Acacia craspedocarpa with *A. aneura* var. *aneura*. *A. eremaea*, *A. grasbyi*
& *A. tetragonophylla*

Understorey:

Primarily perennial and annual chenopods; *Ptilotus obovatus* and
Sclerolaena spp.

Species List (ex vegetation survey quadrats):

Species	Abundance	Total Projected
	Stems/Ha	Cover (%)
<i>Abutilon malvifolia</i>	73.33	0.02
<i>Acacia aneura</i> var. <i>aneura</i>	13.33	2.07
<i>Acacia craspedocarpa</i>	253.33	14.06
<i>Acacia eremaea</i>	13.33	0.60
<i>Acacia grasbyi</i>	20.00	1.28
<i>Acacia kalgoorliensis</i>	6.67	0.27
<i>Acacia tetragonophylla</i>	13.33	0.60
<i>Atriplex holocarpa</i>	20.00	0.00
<i>Atriplex semilunaris</i>	260.00	0.00
<i>Cymbopogon ambiguus</i>	20.00	0.05
<i>Enchylaena tomentosa</i>	6.67	0.01
<i>Eremophila</i> aff. <i>jacunda</i> #145	6.67	0.02
<i>Eremophila longifolia</i>	13.33	0.02
<i>Eremophila platycalyx</i>	26.67	0.30
<i>Frankenia laxiflora</i>	6.67	0.01
<i>Maireana carnososa</i>	760.00	0.08
<i>Maireana georgei</i>	173.33	0.08
<i>Maireana glomerifolia</i>	20.00	0.05
<i>Maireana pyramidata</i>	313.33	2.84
<i>Maireana</i> sp. 218	6.67	0.00
<i>Maireana</i> sp. 225	20.00	0.04
<i>Maireana tomentosa</i>	380.00	5.18
<i>Maireana triptera</i>	1220.00	0.55
Perennial grass	9320.00	1.29

<i>Podolepis capillaris</i>	60.00	0.01
<i>Ptilotus obovatus</i>	840.00	1.06
<i>Ptilotus schwartzii</i>	6.67	0.00
<i>Rhagodia drummondii</i>	53.33	0.25
<i>Sclerolaena burbridgeae</i>	200.00	0.01
<i>Sclerolaena densiflora</i>	1480.00	0.05
<i>Sclerolaena eriacantha</i>	286.67	0.04
<i>Sclerolaena gardneri</i>	6.67	0.00
<i>Sclerolaena</i> sp.	66.67	0.01
<i>Sclerolaena</i> sp. 219	100.00	0.00
<i>Senna artemisioides</i> ssp. <i>X sturtii</i>	13.33	0.00
<i>Senna glutinosa</i> ssp. <i>chatelainiana</i>	13.33	0.05
<i>Sida virgata</i>	46.67	0.01
<i>Solanum lasiophyllum</i>	320.00	0.03
<i>Solanum orbiculatum</i>	6.67	0.07
<i>Stipa elegantissima</i>	6.67	0.01
Total 40 species	16,473/ha	31.02%

Other species found:

Aristida contorta
Atriplex codonocarpa
Eremophila lachnocalyx
Ptilotus gaudichaudii var. *parviflorus*
Total 4 species

Vegetation at The Granites - South (Site 2A)

Site 3: Mt. Warrambo

Land System: Gabanintha Unit 1, after Curry *et al* (1994)

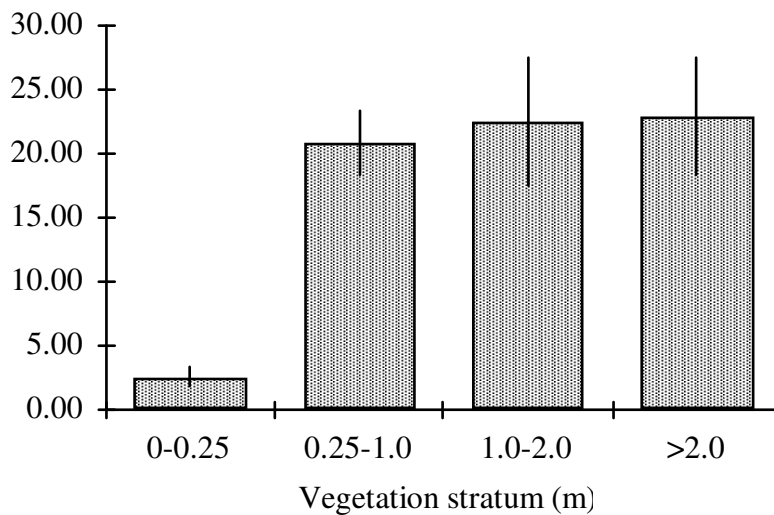
Soil Description: Rocky Jaspilite hill with little free soil. Rocks comprise approx 80% surface. soil pH 5.1, 61.2% of soil >2mm.

Summary Vegetation Profile

Moderately close mulga woodland over a moderately close mixed understorey.
4.83% cover dead material.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	2.64	0.68
0.25 - 1.0m	20.82	2.54
1.0 - 2.0m	22.47	5.01
> 2.0m	22.93	4.61
Total	53.98	6.95

Mean % cover of each vegetation stratum at Site 3.



Major Vegetation Components:

Upper storey:

Acacia aneura var. *aneura* and *A. ayersiana* var. *latifolia* with *A. quadrimarginea*

Understorey:

Consists mainly of *Eremophila* spp., *Thryptomene* spp and various others.

Species List (ex vegetation survey quadrats):

Species	Abundance stems/Ha	Total Projected Cover (%)
<i>Acacia aneura</i>	13.33	0.11
<i>Acacia aneura</i> var. <i>aneura</i>	586.67	24.92
<i>Acacia ayersiana</i> var. <i>latifolia</i>	160.00	6.88
<i>Acacia quadrimarginea</i>	40.00	2.47
<i>Acacia tetragonophylla</i>	6.67	0.00
<i>Dodonaea petiolaris</i>	13.33	0.02
<i>Eremophila</i> aff. <i>jacunda</i>	1406.67	4.64
<i>Eremophila latrobei</i>	1506.67	5.87
<i>Eriostemon brucei</i>	66.67	0.19
<i>Ptilotus obovatus</i>	66.67	0.19
<i>Ptilotus schwartzii</i>	340.00	0.05
<i>Scaevola spinescens</i>	26.67	0.20
<i>Sida filiformis</i>	1566.67	2.70
<i>Sida</i> sp.	40.00	0.01
<i>Solanum lasiophyllum</i>	613.33	0.08
<i>Thryptomene aspera</i>	113.33	0.90
<i>Thryptomene decussata</i>	180.00	4.18
Total 17 species	6,746	53.41%

Additional species found:

Acacia oswaldii

Acacia rhodophloia

Grevillea berryana

Senna glutinosa ssp. charlesiana

Total 4 species

Vegetation at Mt Warrambo (Site 3A)

Site 4: Boomer - South

Land System: Jundee Unit 5, after Curry *et al* (1994)

Soil Description: Deep, red-brown loam, pH 5.4, 14.5% of soil > 2mm.

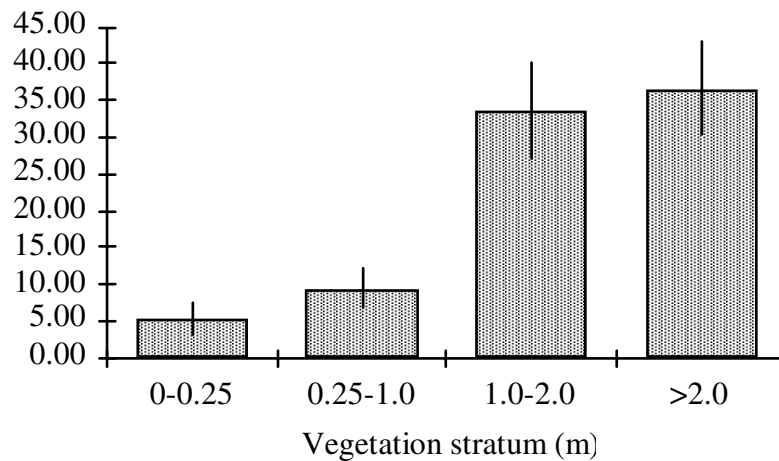
Summary Vegetation Profile:

Close mulga woodland over a very scattered mixed understorey.

4.4% cover dead material.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	5.45	2.12
0.25 - 1.0m	9.51	2.76
1.0 - 2.0m	33.60	6.55
> 2.0m	36.67	6.31
Total	52.33	7.32

Mean percentage cover of each vegetation stratum at Site 4.



Major Vegetation Components:

Upper storey:

Acacia aneura var. *aneura* and *A. ramulosa* with *A. tetragonophylla*

Understorey:

Mainly composed of *Eremophila* spp. and *Ptilotus* spp.

Species list (ex vegetation survey quadrats):

Species	Stems/Ha	Mean % cover
<i>Canthium attenuatum</i>	13.33	0.07
<i>Sida virgata</i>	13.33	0.00
<i>Spartothamnella teucriflora</i>	80.00	0.36
<i>Ptilotus divaricatus</i>	6.67	0.07
<i>Solanum ferrocissimum</i>	33.33	0.00
<i>Acacia aneura</i> var. <i>aneura</i>	726.67	34.35
<i>Acacia ramulosa</i>	126.67	2.83
<i>Acacia tetragonophylla</i>	66.67	1.32
<i>Canthium latifolium</i>	6.67	0.03
Chenopod	13.33	0.13
<i>Rhagodia drummondii</i>	80.00	1.40
<i>Dianella revoluta</i>	20.00	0.14
<i>Eremophila</i> sp. 207	13.33	0.13
<i>Eremophila punicea</i>	466.67	3.63
<i>Eremophila fraseri</i>	20.00	0.53
<i>Eremophila platycalyx</i>	6.67	0.10
<i>Eremophila phyllopoda</i>	126.67	0.43
<i>Grevillea stenobotrya</i>	13.33	5.33
<i>Marsdenia australis</i>	53.33	0.03
<i>Maireana thesioides</i>	60.00	0.25
<i>Ptilotus schwartzii</i>	53.33	0.02
<i>Ptilotus divaricatus</i>	6.67	0.03
<i>Ptilotus obovatus</i>	246.67	0.41
<i>Senna artemisioides</i>	106.67	0.71
<i>Solanum lasiophyllum</i>	113.33	0.02
Total 25 species	2,473/ha	52.33%

Additional species found:

Brachychiton gregorii

Canthium lineare

Solanum ferrocissimum

Total 3 species

Vegetation at Boomer South (Site 4A)

Site 5: Franks Tower

Land System: Jundee Unit 2, after Curry *et al* (1994)

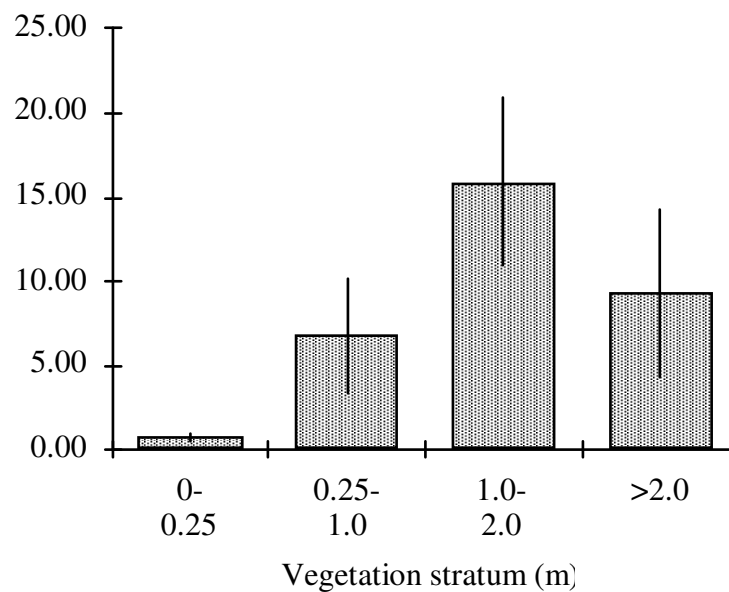
Soil description: Stony clay-loam, pH 5, 41.2% soil > 2mm.

Summary Vegetation Profile:

Scattered mulga woodland over a very scattered mixed understorey, 3.2%
cover dead material.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	0.81	0.26
0.25 - 1.0m	6.81	3.43
1.0 - 2.0m	15.93	5.02
> 2.0m	9.33	4.96
Total	18.42	4.99

Mean percentage cover of each vegetation stratum at Site 5



Major Vegetation Components:

Upper storey:

Acacia aneura and *A. ramulosa* with *A. tetragonophylla*

Understorey:

Mixed chenopods (*Maireana*), *Eremophila spp.* and *Ptilotus spp.*

- note low % cover values for understorey species

Species list (ex vegetation survey quadrats):

Species	Stems/Ha	Mean % cover
<i>Acacia aneura</i>	80.00	8.33
<i>Acacia aneura</i> var. <i>aneura</i>	20.00	6.40
<i>Acacia ramulosa</i>	20.00	1.67
<i>Acacia tetragonophylla</i>	13.33	0.87
ASTERACEAE sp.	6.67	0.00
<i>Brachychiton gregorii</i>	6.67	0.01
<i>Dianella revoluta</i>	26.67	0.07
<i>Eremophila latrobei</i>	6.67	0.00
<i>Eremophila pantonii</i>	106.67	0.13
<i>Eremophila punicea</i>	20.00	0.04
<i>Eremophila</i> sp.	6.67	0.00
<i>Maireana carnososa</i>	13.33	0.00
<i>Maireana pyramidata</i>	6.67	0.02
<i>Maireana</i> sp.	6.67	0.00
<i>Maireana thesioides</i>	53.33	0.30
Perennial grasses	340.00	0.03
<i>Ptilotus obovatus</i>	6.67	0.01
<i>Ptilotus schwartzii</i>	760.00	0.51
<i>Scaevola tomentosa</i>	53.33	0.00
<i>Sclerolaena</i> sp.	200.00	0.00
<i>Sida virgata</i>	6.67	0.00
<i>Solanum lasiophyllum</i>	73.33	0.03
<i>Spartothamnella teucriflora</i>	53.33	0.00
Total 23 species	1886/ha	18.42%

Additional species found:

Eremophila fraseri ssp. *galeata*

Vegetation at Franks Tower (Site 5C)

Site 6: Mayflower

Land System: Austin Unit 2, after Curry *et al* (1994).

Soil Description: Very alkaline loam, pH 9.2, with much exposed quartz.

29.54% soil > 2mm

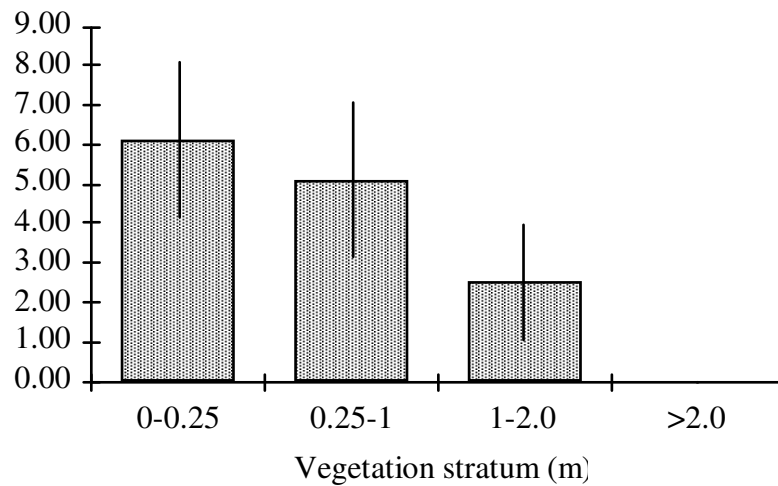
Summary Vegetation Profile:

Very scattered chenopod shrubland with very scattered emergent *Acacia* spp.

0.17% cover from dead material

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	6.14	1.99
0.25 - 1.0m	5.13	1.96
1.0 - 2.0m	2.53	1.45
> 2.0m	0.00	0.00
Total	7.41	2.22

Mean percentage cover of each vegetation stratum at site 6.



Major Vegetation Components

Upper storey:

Occasional *Acacia kalgoorliensis* with some *A. tetragonophylla*

Understorey:

Predominantly chenopods

Species list (ex vegetation survey quadrats):

Species	stems/Ha	Mean % cover
<i>Acacia kalgoorliensis</i>	113.3	3.2
<i>Acacia tetragonophylla</i>	13.3	0.1
<i>Atriplex codonocarpa</i>	733.3	0.1
<i>Chenopodium gaudichaudianum</i>	6.7	0.0
<i>Lycium australe</i>	26.7	0.3
<i>Maireana trichoptera</i>	7446.7	0.9
<i>Maireana carnosia</i>	20.0	0.0
<i>Maireana pyramidata</i>	233.3	1.0
<i>Maireana thesioides</i>	13.3	0.0
<i>Maireana triptera</i>	2753.3	0.3
Perennial Grasses	2000.0	0.2
<i>Pimelia microcephala</i>	6.7	0.1
<i>Ptilotus exaltatus</i>	40.0	0.0
<i>Ptilotus obovatus</i>	6.7	0.0
<i>Scaevola spinescens</i>	13.3	0.1
<i>Sclerolaena</i> sp. 256	13.3	0.1
<i>Sclerolaena densiflora</i>	533.3	0.1
<i>Sclerolaena</i> sp. 250	13.3	0.0
<i>Sclerolaena</i> sp. 254	20.0	0.0
<i>Senna artemisioides</i> ssp. <i>X sturtii</i>	13.3	0.1
<i>Senna artemisioides</i>	46.7	0.0
<i>Solanum lasiophyllum</i>	60.0	0.0
<i>Stipa elegantissima</i>	26.7	0.4
<i>Solanum</i> sp. 257	6.7	0.3
Total 24 species	14,160/ha	7.28%

Additional species found:

Acacia oswaldii
Eremophila sp. 252
Sclerolaena sp. 255
Senna artemisioides ssp. artemisioides
Total 4 species

Vegetation at Mayflower (Site 6C)

Site 7: Jaspilite Creek

Land System: Wiluna Unit 7. after Curry *et al* (1994)

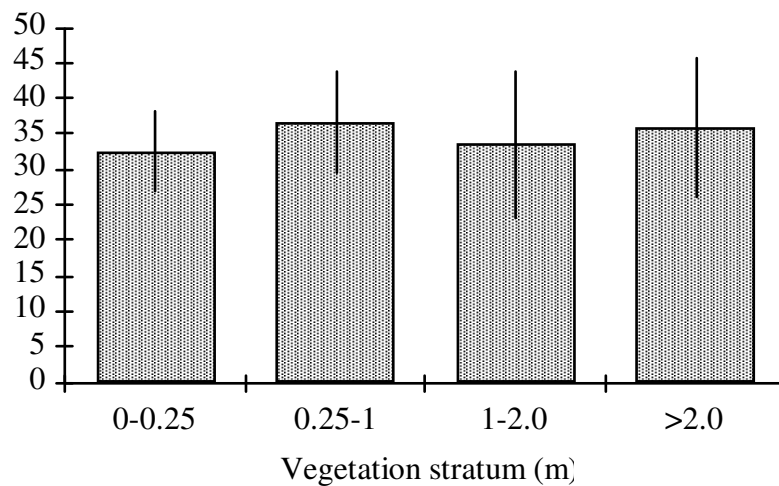
Soil Description: Gravely loam over hardpan (50cm approx), pH 7.1,
2.3% of soil >2mm

Summary Vegetation Profile:

Close *Acacia* and Eucalypt woodland with diverse close mid and lower storeys. 6.1% cover dead material.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	32.51	5.64
0.25 - 1.0m	36.61	7.23
1.0 - 2.0m	33.58	10.41
> 2.0m	35.90	9.78
Total	73.92	9.21

Mean % cover of each vegetation stratum at site 7.



Major Vegetation Components:

Upper Storey

Close mixed Mulga woodland (*Acacia oswaldii*, *A. tetragonophylla*, *A. aneura* var. *aneura*, *Acacia acuminata* and *Eremophila oldfieldii*) with occasional *Eucalyptus striaticalyx* in remnant pockets.

Understorey

Mixed close, diverse understorey.

Species list (ex vegetation monitoring quadrats):

Species	Stems/Ha	mean % cover
<i>Acacia acuminata</i>	60.00	5.74
<i>Acacia aneura</i> var. <i>aneura</i>	100.00	12.40
<i>Acacia microcalyx</i>	73.33	2.48
<i>Acacia oswaldii</i>	106.67	0.38
<i>Acacia rhodophloia</i>	20.00	0.30
<i>Acacia tetragonophylla</i>	86.67	0.97
<i>Amyema nestor</i>	13.33	0.20
<i>Atriplex bunburyana</i>	6.67	0.02
<i>Atriplex codonocarpa</i>	133.33	0.01
<i>Atriplex holocarpa</i>	20.00	0.00
<i>Dodonaea larraeoides</i>	86.67	2.60
<i>Enchylaena tomentosa</i>	293.33	1.01
<i>Eremophila</i> aff. <i>clarkei</i>	13.33	0.07
<i>Eremophila oldfieldii</i>	126.67	2.63
<i>Eremophila oppositifolia</i>	13.33	0.12
<i>Eremophila pantonii</i>	73.33	0.67
<i>Eucalyptus striaticalyx</i>	66.67	17.00
<i>Exocarpus aphyllus</i>	46.67	1.15
<i>Frankenia laxiflora</i>	133.33	0.06
<i>Lycium australe</i>	46.67	0.47
<i>Lysiana murrayi</i>	266.67	0.57
<i>Maireana georgei</i>	126.67	0.01
<i>Maireana pyramidata</i>	1046.67	10.02
<i>Maireana tomentosa</i>	6.67	0.01
<i>Maireana trichoptera</i>	53.33	0.10

Maireana triptera	400.00	0.30
Melaleuca lateriflora var. lateriflora	13.33	0.40
Vittadinia eremaea	40.00	0.01
Olearia pimeleoides var. incana	6.67	0.00
Perennial grasses	666.67	0.07
Pittosporum phylliraeoides	13.33	0.01
Porana sericea	86.67	2.00
Ptilotus divaricatus	80.00	0.25
Ptilotus exaltatus	13.33	0.00
Ptilotus obovatus	200.00	0.24
Rhagodia crassifolia	33.33	0.64
Rhagodia drummondii	73.33	0.49
Scaevola spinescens	120.00	1.09
Sclerolaena cuneata	40.00	0.01
Sclerolaena diacantha	160.00	0.01
Sclerolaena sp. 255	1286.67	0.13
Sclerolaena sp. 256	66.67	0.01
Sclerostegia disarticulata	833.33	3.66
Senna artemisioides	13.33	0.13
Senna artemisioides ssp. petiolaris	6.67	0.00
Senna artemisioides ssp. X sturtii	20.00	0.07
Senna glutinosa ssp. chatelainiana	6.67	0.02
Sida virgata	260.00	0.15
Solanum lasiophyllum	293.33	0.30
Solanum orbiculatum	26.67	0.17
Stipa elegantissima	1426.67	4.67
Zygophyllum eremaeum	20.00	0.07
Total 52 species	9,226/ha	73.85%

Additional species found:

Acacia masliniana

Alyxia tetanifolia

Atriplex semilunaris

Hakea sp. 161

Maireana carnososa

Maireana glomerifolia

Senna artemisioides ssp. *filifolia*

Total 7 species

Vegetation at Jaspilite Creek (Site 7C)

Site 8: Jaspilite - Quartz Plain

Land System: Wiluna Unit 3. After Curry *et al* (1994)

Soil Description: Stony, quartz pebbled plain with loamy sub soil, pH 6.4,
39.6% of soil >2mm

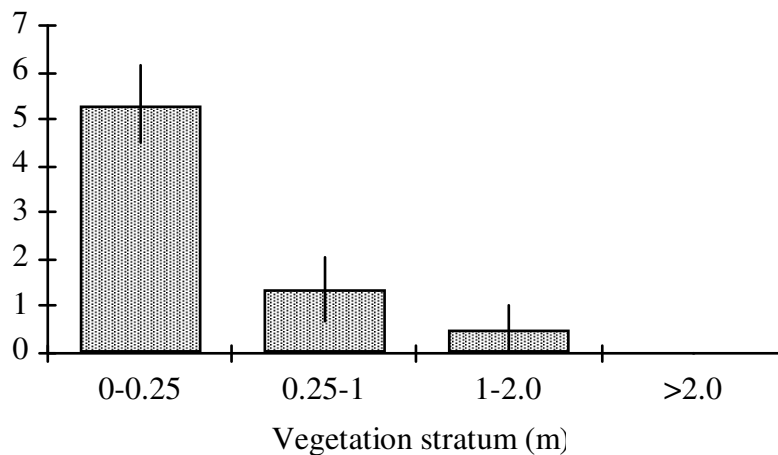
Summary Vegetation Profile:

Very scattered chenopod shrubland with very scattered *Acacia spp.*

0.2% cover by dead material

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	5.33	0.82
0.25 - 1.0m	1.37	0.69
1.0 - 2.0m	0.53	0.48
> 2.0m	0.00	0.00
Total	5.60	0.95

Mean percentage cover of each vegetation stratum at Site 8.



Major Vegetation Components:

Upper storey:

Very scattered *Acacia aneura*, *A. masliniana*, *A. microcalyx*.

Understorey:

Primarily chenopods, particularly *Sclerostegia disarticulata*. *Maireana* & *Sclerolaena* species. Also *Carpobrotus* sp.

Species list (ex vegetation monitoring quadrats)

Species	Stems/Ha	% cover
<i>Acacia aneura</i>	6.67	0.13
<i>Acacia masliniana</i>	6.67	0.20
<i>Acacia microcalyx</i>	40.00	0.40
<i>Acacia tetragonophylla</i>	6.67	0.27
<i>Atriplex codonocarpa</i>	20.00	0.00
<i>Brachycome ciliaris</i>	40.00	0.01
<i>Dysphemia crassifolium</i> .	333.33	0.31
<i>Eremophila oppositifolia</i>	6.67	0.00
<i>Hakea preissii</i>	6.67	0.07
<i>Maireana</i> aff. <i>tomentosa</i>	86.67	0.03
<i>Maireana carnososa</i>	1553.33	0.04
<i>Maireana georgei</i>	626.67	0.46
<i>Maireana georgei</i> x <i>Enchylaena</i>	6.67	0.00
<i>Maireana glomerifolia</i>	180.00	0.20
<i>Maireana pyramidata</i>	73.33	0.27
<i>Maireana</i> sp.	26.67	0.03
<i>Maireana triptera</i>	280.00	0.14
Perennial grasses	333.33	0.02
<i>Ptilotus exaltatus</i>	6.67	0.00
<i>Ptilotus obovatus</i>	206.67	0.21
<i>Ptilotus polakii</i>	6.67	0.01
<i>Scaevola spinescens</i>	13.33	0.13
<i>Sclerolaena cuneata</i>	13.33	0.00
<i>Sclerolaena eriacantha</i>	1720.00	0.07
<i>Sclerolaena</i> sp.	2986.67	0.09
<i>Sclerostegia disarticulata</i>	4773.33	2.20

Senna glutinosa ssp. charlesiana	6.67	0.00
Senna artemisioides ssp. X sturtii	13.33	0.11
Sida virgata	46.67	0.12
Solanum lasiophyllum	93.33	0.09
Vittadinia eremaea	6.67	0.01
Unknown sp. #260	53.33	0.11
Total 32 species	13,580/ha	5.71%

Nil additional species.

Vegetation at Jaspilite Quartz Plain (Site 8A)

Opportunistic Site : Lateritized Plateau adjacent to East Wanderrie

Land System: Kalli Unit 5. After Curry *et al* (1994)

Soil Description:

Very shallow gravely to nil soil over hard lateritized plateau and breakaways with kaolinised footslopes.

Summary Vegetation Profile:

Very scattered mulga woodland over a scattered understorey.

Major Vegetation Components:

Upper storey:

Acacia aulacophylla and *A. aneura*

Understorey:

Mixed species including *Micromyrtus sulphuriae* and three priority taxa.

Species found in opportunistic collections:

Species	Priority Status
Acacia aneura #90	
Acacia aneura #91	
Acacia aulacophylla	
Acacia ayersiana var latifolia	
Acacia rhodophloia	
Acacia sp #97	
Amperea sp	
Calytrix erosipetala	3
Dodonaea viscosa ssp spathulata	
Eragrostis sp	
Eremophila latrobei	
Eriostemon brucei	
Grevillea stenobotrya	
Leucopogon sp #86 aff breviflorus	3
Maireana thesioides	
Melaleuca eleutherostachya	
Micromyrtus sulphuriae	
Prostanthera magnifica	2
Ptilotus obovatus	
Ptilotus schwartzii	
Rhagodia drummondii	

Stipa elegantissima

Thryptomene decussata

Verticordia picta

Total 24 species

Vegetation on Lateritized Plateau

Opportunistic Site : Success Hill

Land System: Gabanintha Unit 1. After Curry *et al* (1994)

Soil Description: Very rocky diorite hill with limited soil. Extensive lower slopes. Similar in general character to Mt Warramboe q.v.

Vegetation:

Scattered low mulga woodland over scattered shrubland.

Major Vegetation Components:

Upper storey:

Acacia speckii (MS) and *A. sp.* "diorite"

Understorey:

Dodonaea pinifolia, *Eremophila freelingii*, *Grevillea inconspicua*.

Species found in opportunistic collections:

Species	Priority Status
<i>Acacia aneura</i>	
<i>Acacia sp</i> "diorite"	
<i>Acacia speckii</i> (MS)	
<i>Dodonaea pinifolia</i>	
<i>Eremophila freelingii</i>	
<i>Euphorbia aff drummondii</i>	
<i>Grevillea inconspicua</i>	D.R.F.
<i>Ptilotus sp aff obovatus</i>	
<i>Santalum spicatum</i>	
<i>Senna glutinosa ssp charlesiana</i>	

Site 9: Jaspilite Rehabilitated Waste Dump

Soil description:

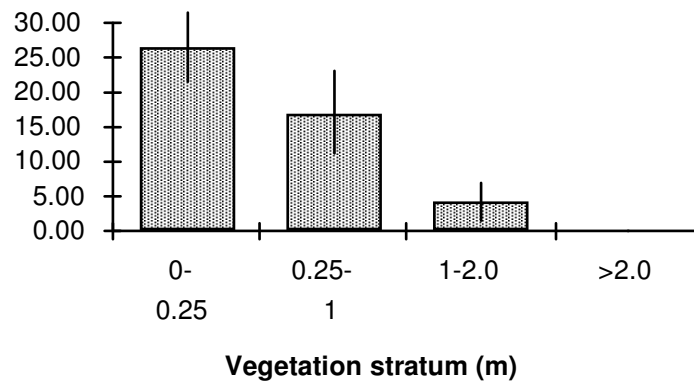
Waste rock dump with capping of oxidised rock material.

Summary Vegetation Profile:

Moderately close chenopod shrubland with various emergent species.

Stratum	Mean % cover at each stratum	Std Error
0 - 0.25m	26.29	4.98
0.25 - 1.0m	16.88	5.96
1.0 - 2.0m	4.03	2.80
> 2.0m	0.00	0.00
Total	26.30	5.04

**Total % cover of each
vegetation stratum at site 9**



Species list (ex vegetation survey quadrats):

	stems/Ha	mean % cover
<i>Acacia aneura</i>	10	0.009
<i>Acacia ligulata</i>	70	1.054
<i>Atriplex amnicola</i>	30	1.83
<i>Atriplex canescens</i>	10	0.8
<i>Atriplex codonocarpa</i>	1660	0.148
<i>Atriplex lentiformis</i>	520	2.602
<i>Atriplex semilunaris</i>	10	0.004
<i>Atriplex stipitata</i>	20	0.13
<i>Dodonaea laraeoides</i>	150	0.135
<i>Enchylaena tomentosa</i>	10	0.08
<i>Eucalyptus striatocalyx</i>	20	0.054
<i>Frankenia laxiflora</i>	10	0.004
<i>Hakea preissii</i>	10	0.001
<i>Maireana aff. tomentosa</i>	110	0.275
<i>Maireana carnosa</i>	30	0.018
<i>Maireana convexa</i>	40	0.15
<i>Maireana georgei</i>	40	0.13
<i>Maireana pyramidata</i>	340	3.001
<i>Maireana sp.</i>	50	0.08
<i>Maireana trichoptera</i>	20	0.012
<i>Maireana triptera</i>	300	3.185
<i>Ptilotus exaltatus</i>	30	0.003
<i>Radyera farragei</i>	20	0.026
<i>Rulingia kempeana</i>	420	0.585
<i>Scaevola spinescens</i>	20	0.022
<i>Sclerolaena cuneata</i>	270	1.063
<i>Sclerolaena densiflora</i>	210	0.021
<i>Sclerolaena eriacantha</i>	1510	0.22
<i>Sclerolaena sp.</i>	10	0.025
<i>Sclerostegia disarticulata</i>	6150	10.58
<i>Senna artemisioides</i>	40	0.018
<i>Senna artemisioides ssp. X sturtii</i>	20	0.009
<i>Sida virgata</i>	30	0.012
<i>Solanum lasiophyllum</i>	30	0.009
Total 34 species	12,220/ha	26.295%

Vegetation on Rehabilitated Waste Dump at Jaspilite (Site 9B)

Appendix 2

Complete Systematic Species List

Appendix 2: Systematic species list

FAMILY	GENUS	SPECIES	SSP. or VAR.
AIZOACEAE	Dysphemia	crassifolium	
	Micropterum	papulosum	
AMARANTHACEAE	Ptilotus	divaricatus	
	Ptilotus	exaltatus	var. exaltatus
	Ptilotus	gaudichaudii	var. parviflorus
	Ptilotus	helipteroides	var. helipteroides
	Ptilotus	macrocephalus	
	Ptilotus	obovatus	
	Ptilotus	polakii	
	Ptilotus	rotundifolius	
	Ptilotus	schwartzii	
	Ptilotus	sp. #176	
APOCYNACEAE	Alyxia	tetanifolia	
ASCLEPIADACEAE	Marsdenia	australis	
ASTERACEAE	Brachycome	ciliaris	
	Cratystylis	conocephala	
	Erymophyllum	ramosum	ssp. ramosum
	Olearia	aff. stuartii	
	Olearia	calcarea	
	Olearia	pimeleoides	
	Olearia	pimeleoides	var. incana
	Podolepis	capillaris	
	Senecio	lautus	ssp. dissectifolius
	Streptoglossa	liatroides	
Vittadinia	eremaea		
BRASSICACEAE	Lepidium	platypetalum	

CAESALPINIACEAE

Senna	artemisioides	ssp. X artemisioides
Senna	artemisioides	ssp. filifolia
Senna	artemisioides	ssp. helmsii
Senna	artemisioides	ssp. X sturtii
Senna	cardiosperma	ssp. cardiosperma
Senna	cardiosperma	ssp. stowardii
Senna	glutinosa	ssp. charlesiana
Senna	glutinosa	ssp. chatelainiana
Senna	pleurocarpa	ssp. angustifolia

CASUARINACEAE

Allocasuarina	sp. #167
---------------	----------

CHENOPODIACEAE

Atriplex	amnicola*	
Atriplex	bunburyana	
Atriplex	canescens*	
Atriplex	codonocarpa	
Atriplex	holocarpa*	
Atriplex	lentiformis	
Atriplex	nummularia*	
Atriplex	semilunaris	
Atriplex	stipitata*	
Chenopodium	gaudichaudianum	
Enchylaena	tomentosa	
Maireana	aff. tomentosa	
Maireana	carnosa	
Maireana	convexa	
Maireana	georgei	
Maireana	georgei x Enchylaena tomentosa (Hybrid)	
Maireana	glomerifolia	
Maireana	pyramidata	
Maireana	thesioides	
Maireana	tomentosa	ssp. tomentosa
Maireana	tomentosa	a form #225
Maireana	trichoptera	
Maireana	trichoptera	Hybrid ?
Maireana	triptera	
Rhagodia	crassifolia	
Rhagodia	drummondii	
Rumex	vesicarius*	
Salsola	kali	
Sclerolaena	brevifolia	
Sclerolaena	burbidgeae	

CHENOPODIACEAE	Sclerolaena	cuneata
	Sclerolaena	densiflora
	Sclerolaena	ericantha
	Sclerolaena	gardneri
	Sclerolaena	microcarpa
	Sclerolaena	sp. 215
	Sclerostegia	disarticulata
CHLOANTHACEAE	Dicrastylis	lineariifolia
	Spartothamnella	teucriflora
CONVULVACEAE	Porana	commixta
	Porana	sericea
EPACRIDACEAE	Leucopogon	sp. #86 aff breviflorus
EUPHORBIACEAE	Amperea	sp. #204
	Euphorbia	drummondii
FRANKENIACEAE	Frankenia	cinerea
	Frankenia	laxiflora
GOODENIACEAE	Scaevola	spinescens
	Scaevola	tomentosa
LAMIACEAE	Prostanthera	magnifica
	Prostanthera	wilkeana
LOBELIACEAE	Isotoma	petraea
LORANTHACEAE	Amyema	nestor
	Lysiana	murrayi

MALVACEAE

Abutilon	malvifolia
Radyera	farragei
Sida	filiformis
Sida	virgata

MIMOSACEAE

Acacia	"Diorite"	
Acacia	"Gizzard"	
Acacia	acuminata	
Acacia	aff. quadrimarginea	
Acacia	aneura	
Acacia	aneura	var. aneura
Acacia	aneura	var. conifera
Acacia	aulacophylla MS	
Acacia	ayersiana	var. latifolia
Acacia	cibaria	
Acacia	coolgardiensis	ssp effusa
Acacia	craspedocarpa	
Acacia	erinaceae	
Acacia	eremaea	
Acacia	exocarpoides	
Acacia	grasbyi	
Acacia	jamesiana	
Acacia	kalgoorliensis MS	
Acacia	ligulata	
Acacia	masliniana	
Acacia	microcalyx	
Acacia	murrayana	
Acacia	oswaldii	
Acacia	pruinocarpa	
Acacia	ramulosa	
Acacia	rhodophloia	
Acacia	sp. #97	
Acacia	speckii	
Acacia	tetragonophylla	
Acacia	victoriae	

MYOPORACEAE

Bursaria	occidentalis
Eremophila	aff. alternifolia
Eremophila	aff. clarkei
Eremophila	aff. flabellata MS
Eremophila	aff. gibsonii
Eremophila	aff. jacunda

MYOPORACEAE	Eremophila	aff. pendulina	
	Eremophila	aff. serrulata	
	Eremophila	exilifolia	
	Eremophila	forrestii	ssp. forrestii
	Eremophila	fraseri	ssp. galeata
	Eremophila	freelingii	
	Eremophila	glutinosa	
	Eremophila	granitica	
	Eremophila	jacunda MS	
	Eremophila	lachnocalyx	
	Eremophila	latrobei	var. tuberculosa
	Eremophila	longifolia	
	Eremophila	mackinlayi	ssp. spathulata
	Eremophila	miniata	
	Eremophila	oldfieldii	ssp. angustifolia
	Eremophila	oppositifolia	ssp. angustifolia
	Eremophila	pantonii	
	Eremophila	phyllopoda	ssp. phyllopoda
	Eremophila	platycalyx	
	Eremophila	punicea	
Eremophila	sp. 203		
Eremophila	sp. 252		
Eremophila	sp. 276		
MYRTACEAE	Calytrix	erosipetala	
	Darwinia	capitellata	
	Eucalyptus	kingsmillii	ssp. kingsmillii
	Eucalyptus	oldfieldii	
	Eucalyptus	striaticalyx	
	Melaleuca	eleutherostachya	
	Melaleuca	lateriflora	var. lateriflora
	Melaleuca	uncinata	
	Micromyrtus	sulphuriae	
	Thryptomene	aspera	
	Thryptomene	decussata	
	Thryptomene	mucronulata	
	Verticordia	picta	
PAPILIONACEAE	Gastrolobium	laytonii	
	Mirbelia	rhagodioides	
PHORMIACEAE	Dianella	revoluta	

PITTOSPORACEAE

Pittosporum	phylliraeoides	
-------------	----------------	--

POACEAE

Aristida	contorta	
Cymbopogon	ambiguus	
Eragrostis	eriopoda	
Eragrostis	lacunaria	
Eragrostis	setifolia	
Monachather	paradoxa	
Stipa	elegantissima	

PROTEACEAE

Grevillea	aff. berryana	
Grevillea	aff. petrophilioides	
Grevillea	berryana	
Grevillea	deflexa	
Grevillea	eriostachya	ssp. eriostachya
Grevillea	inconspicua	
Grevillea	stenobotrya	
Hakea	arida	
Hakea	preissii	
Hakea	sp. 161	

RUBIACEAE

Canthium	attenuatum	
Canthium	latifolium	
Canthium	lineare	

RUTACEAE

Eriostemon	brucei	ssp brucei
------------	--------	------------

SANTALACEAE

Exocarpus	aphyllus	
Santalum	acuminatum	
Santalum	spicatum	

SAPINDACEAE

Dodonaea	larraeoides	
Dodonaea	microzyga	var acrolobata
Dodonaea	petiolaris	
Dodonaea	pinifolia	
Dodonaea	viscosa	var spathulata

SOLANACEAE

Lycium	australe	
Solanum	ferrocissimum	
Solanum	lasiophyllum	
Solanum	orbiculatum	ssp. orbiculatum

STERCULIACEAE

Brachychiton	gregorii
Keraudrenia	integrifolia
Rulingia	kempeana

STYLIDIACEAE

Stylidium	longibracteatum
-----------	-----------------

THYMELIACEAE

Pimelia	microcephala
---------	--------------

ZYGOPHYLLACEAE

Zygophyllum	eremaeum
-------------	----------

* Denotes non-endemic species

Appendix 3

Rare Flora Reports

Appendix 4 Species Location Spreadsheet

Appendix 5 General Site Descriptions

Vegetation Map Unit Name	Land System after Curry <i>et al</i> (1994)	Generalised Landform Description After Curry <i>et al</i> (1994)	General Vegetation Description	Pastoral Value After Curry <i>et al</i> (1994)
1. East Wanderrrie	Kalli Unit 2	Wanderrrie sand plain on lateritized plateaux and breakaways (up to 25m relief).	Moderately close sandplain <i>Acacia</i> shrubland over a sparse dominantly grass and <i>Eremophila</i> understorey.	Moderate
2. The Granites - South	Austin Unit 3	Gently sloping to almost flat saline stony plains with occasional rises and low ridges on granite or greenstone.	Scattered hop mulga woodland over scattered chenopod understorey.	High
3. Mt Warrambo	Gabanintha Unit 1	Ridges and rounded hills of jaspilite, basalt, dolerite and greenstone.	Moderately close mulga woodland over a moderately close mixed understorey.	Low
4. Boomer South	Jundee Unit 5	Well defined drainage tracts with hardpan at approx. 50cm.	Close mulga woodland over a very scattered mixed understorey.	Low
5. Franks Tower	Jundee Unit 2	Gently sloping to almost flat hardpan plains with veneers of ironstone grit and gravel.	Scattered mulga woodland very scattered mixed understorey.	Low
6. Mayflower	Austin Unit 2	Gently sloping to almost flat saline stony plains with occasional rises and low ridges on granite or greenstone.	Very scattered chenopod shrubland with very scattered emergent <i>Acacia</i> spp.	High
7. Jaspilite Creekline	Wiluna Unit 7	Low lateritized hills with breakaways and extensive lower slopes and stony quartz pebbled plains	Close <i>Acacia</i> and eucalypt woodland with diverse close mid and lower storeys.	Moderate
8. Jaspilite Quartzite Plain	Wiluna Unit 3	Low lateritized hills with breakaways and stony quartz pebbled plains	Very scattered chenopod shrubland (<i>Sclerostegia</i>) with very scattered <i>Acacia</i> spp.	Low
Lateritized Plateau adjacent to East Wanderrrie, opportunistic collections	Kalli Unit 5	Stripped stony plains of ferricrete & silcrete. Low breakaways (up to 25m relief) on margin.	Very scattered mulga woodland over a scattered understorey.	low
Success Hill, opportunistic collections	Gabanintha Unit 1	Ridges and rounded hills of jaspilite, basalt, dolerite and greenstone.	Scattered low mulga woodland over a scattered shrubland.	Low

Appendix 6 Summarised Statistics for Natural Vegetation Monitoring Sites

Vegetation Category Name	Number of species recorded	% of Total # of Species Recorded	Number of priority/DRF species	Total Projected Cover (%)	Mean Abundance (Stems/Ha)	Soil pH
1. East Wanderrie	29	14%	0	44.15	43,160	4.8
2. The Granites - South	44	21%	0	31.02	16,473	6.4
3. Mt Warrambo	21	10%	0	53.41	6,746	5.1
4. Boomer South	28	14%	0	52.33	2,473	5.4
5. Franks Tower	24	12%	0	18.42	1,886	5.0
6. Mayflower	28	14%	0	7.28	14,160	9.2
7. Jaspilite Creek	60	29%	0	73.85	9,227	7.1
8. Jaspilite Quartz Plain	33	16%	0	5.7	13,580	6.4
Lateritized Breakaways adjacent to East Wanderrie, opportunistic collections.	24	12%	3	N/A	N/A	N/A
Success Hill, opportunistic collections.	10	5%	1	N/A	N/A	N/A

--	--	--	--	--	--	--

G.P.S. Locations For October 1994 Vegetation Monitoring Sites (AGD 84)

Site Name & Number	Latitude	Longitude
East Wanderrie 1A	28° 00.675' S	117° 53.219' E
East Wanderrie 1B	28° 00.627' S	117° 52.209' E
East Wanderrie 1C	28° 00.894' S	117° 52.760' E
The Granites Sth 2A	28° 01.211' S	117° 51.825' E
The Granites Sth 2B	28° 01.277' S	117° 52.138' E
The Granites Sth 2C	28° 01.805' S	117° 52.158' E
Mt Warramboos 3A	28° 01.876' S	117° 49.320' E
Mt Warramboos 3B	28° 01.978' S	117° 49.366' E
Mt Warramboos 3C	28° 02.052' S	117° 49.367' E
Boomer 4A	28° 04.441' S	117° 48.362' E
Boomer 4B	28° 04.928' S	117° 48.565' E
Boomer 4C	28° 05.429' S	117° 48.400' E
Franks Tower 5A	28° 04.428' S	117° 46.920' E
Franks Tower 5B	28° 04.217' S	117° 47.277' E
Franks Tower 5C	28° 04.761' S	117° 46.960' E
Mayflower 6A	28° 02.871' S	117° 52.700' E
Mayflower 6B	28° 03.306' S	117° 52.444' E
Mayflower 6C	27° 59.545' S	117° 49.668' E
Jaspilite Creek 7A	27° 59.268' S	117° 49.103' E
Jaspilite Creek 7B	27° 59.412' S	117° 49.362' E
Jaspilite Creek 7C	27° 59.563' S	117° 48.952' E
Jaspilite Qtz Plain 8A	27° 59.401' S	117° 48.950' E
Jaspilite Qtz Plain 8B	27° 59.481' S	117° 49.073' E
Jaspilite Qtz Plain 8C	27° 59.631' S	117° 48.906' E
Jaspilite Rehab 9A	27° 59.303' S	117° 49.208' E
Jaspilite Rehab 9B	27° 59.304' S	117° 49.178' E
Lateritized Plateau	28° 01.158' S	117° 53.411' E
Success Hill	27° 55.345' S	117° 48.688' E

Corrigenda

Page	Details
TOC	Add "Table of Contents" heading
3	Heading Terminology should be between paragraphs 2 & 3. 4th paragraph, line 30; "...Hopkins 1990)" should read "...Hopkins (1990)" 4th Para, line 31; delete the word "below" 6th para, line 39; delete the word "below"
6	Table 1 (heading) delete: "and soil type information"
8	sub heading (iii) delete tab to bring in line with others sub
headings	
9	Table 3, column 2, line 2: "1.5 - 1.0m" should read "0.5 - 1.0m"
10	Paragraph 5, line 41: "repeatedly" should read "reportedly"
also	Paragraph 5, line 42: After " <i>Acacia kalgoorliensis</i> MS", add " was recorded at two sites."
12	line 8; "that expected" should read "than expected" line 22; delete "of which" line 24; "Calytrix" should read "Calytrix"
15	line 9; "aboriginal" should read "Aboriginal" line 21, Tab heading "3.1.4..." to right 2 spaces. line 40, delete "overleaf"
15 & 17	line 41; heading "Species Diversity" should be at top of page 17.
17	paragraph 1, line 5; "complex" should read "complex" line 9, tab right one space heading "Species Distributions" line 34, tab to right one space heading "Summary"

- 18 Table 4, heading in 1st column should read "Number of sites at which species were recorded within quadrats"
- 19 delete comma after "Mr Trevor McKenzie"
add comma after "Mr Malcolm Trudgeon"
add footer & page number to page 19
- 20 Bibliography. Remove tabs from second lines (lines 24 & 26) of the two references to articles by Cranfield R.J.
- 24 "Acacia murryana" should read "Acacia murrayana"

Corrigenda (cont'd):

Page	Details
24	Scaevola spinescens" should read " Scaevola spinescens"
25	Second heading should read: "Species Found In The Lateritized Plateau - Wanderrrie Interzone"
40	line 6; tab the abbreviation "spp." to right one space.
44	line 4; remove tab between words " <i>aneura</i> " and " <i>var aneura</i> " line 4; "Acacia acuminata" should read "Acacia acuminata"
50	line 7; "Vary" should read "Very"
51	line 4; remove tabs between "slopes." and "Similar"
52	photograph of "Vegetation on Rehabilitated Waste Dump at Jaspilite (Site 9B)" should have been inserted as page 55.
63	incomplete page of species list: three families omitted. Note: Copy of replacement page 63 attached.

Geoff Cockerton B.Sc.
6th April 1995