Jims
SEEDS, WEEDS
& TREES

# Vegetation Survey of Three Rehabilitated Sites For Kalgoorlie Consolidated Gold Mines (KCGM) Pty Ltd

2006

Final

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## Appendices

# 1 Introduction

Kalgoorlie Consolidated Gold Mines (KCGM) tenements are located directly to the east of the City of Kalgoorlie Boulder, Western Australia. The mining activities include underground workings, as well as open cut gold mining methods. The purpose of this assessment was to identify the vegetation composition of three specific areas which have previously undergone rehabilitation, between the years 1991 and 1998.

## 1.1 Topography, Climate and Soils

The survey area is located within the Coolgardie Botanical District of the South Western Interzone (Beard, 1990). This botanical district is predominantly eucalypt woodland, becoming open towards the more calcareous soils, where a cover of saltbush-bluebush understorey is evident. A gently undulating topography is broken up with occasional ranges of low hills. Sand plains are more prominent in the western part with some large playa lakes. Principally the soils are brown calcareous earths. The climate of this region is arid, which is characterized by cool winters and hot, dry summers. Rainfall occurs in winter with an annual precipitation of 268.4mm in 2004 (Bureau of Meteorology, 2005).

## 1.2 Vegetation

The dominant plant families within the Coolgardie Botanical District include Myrtaceae, Asteraceae, Chenopodiaceae and Poaceae. Eucalypt woodlands, which cover 6.8% of the area of the State of Western Australia, characterize the Coolgardie Botanical District (ANRA, 2005).

## 2 Methods

Jim's Seeds, Weeds & Trees Pty Ltd was commissioned in January 2006 to conduct a flora survey of the vegetation occurring at three specific rehabilitated areas; these being the locations for the proposed Golden Pike Cutback and the Northern Waste Rock Dumps. Prior to any field work a desktop study was completed outlining the species used in the seed mix for rehabilitation, and used to compare with the list of species generated in the survey.

The areas were then traversed by three people on the 9th January 2006. The total area surveyed was approximately 161ha, in size.

The rehabilitated areas were easily accessible throughout and were extensively covered using GPS units to survey the area via vehicle and on foot where appropriate. This survey was carried out in accordance with Jim's Seeds, Weeds & Trees Pty Ltd Safety and Environmental Management Plans. The survey was also conducted in accordance with the EPA's Guidance Statement No.51.

Different vegetation groups when encountered were described and the vegetation associations were examined for the presence or absence of any Declared Rare Flora (DRF) and Priority flora species.

The optimum time for the survey would ultimately be during the early spring period, as this could also account for the annuals present in the area. Therefore not all species that occur in the area may have been recorded in this survey.

Prior to the field survey, the results of the combined search of CALM's Declared Rare and Priority Flora (CALM 2005) and the Western Australian Herbarium (WAHERB 2005) databases, were examined for species recorded within coordinates encompassing the survey area (GDA 94 51J ). The results of this search are listed in Appendix 1. These significant flora species were examined on the Western Australian Herbarium's web page (WAHERB 2005) prior to the survey, and also where applicable, the locations of these Priority species were traversed in order to familiarise ourselves with the field specimens. Specimens collected during the survey were identified with the aid of samples housed at the Western Australian Herbarium, and where necessary, specialists were consulted.

Table 1 represents the definitions of Declared Rare and Priority Flora ratings under the Wildlife Conservation Act (1950) as extracted from Department of Conservation and Land Management (2005).

**Table 1:** Definitions of Rare and Priority Flora Species (CALM 2005).

| |
|---|
| R: Declared Rare Flora – Extant Taxa<br>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. |
| X: Declared Rare flora – Presumed Extinct Taxa<br>Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such. |
| 1: Priority One – Poorly known Taxa<br>Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small populations size, or being on lands under immediate threat, eg road verges, urban areas, farmland, active mineral leases, etc, or the plants are under threat, eg. From disease, grazing by feral animals, etc. May include taxa with threatened populations in protected lands. Such taxa are under consideration for declaration as "rare flora", but are in urgent need of further survey. |
| 2: Priority Two – Poorly Known Taxa<br>Taxa which are known from one of a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as "rare flora", but are in urgent need of further survey. |
| 3: Priority Three – Poorly known Taxa<br>Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally <5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as "rare flora" but are in need of further survey. |
| 4: Priority Four – Rare Taxa<br>Taxa, which are considered to have been adequately surveyed, and which whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years |

### 2.1 Objectives

The objectives of this flora survey were to;

- Traverse the three rehabilitation areas.
- Identify known and collect unknown vascular plant taxa in the survey area.
- Provide a description of the different vegetation communities occurring within the survey area.
- Map the vegetation communities encountered.
- Assess the vegetation condition in accordance with Keighery (1994).
- Assess the clearing principles specifically relating to native vegetation.

# 3 Results

One vegetation group was encountered within the three rehabilitation areas. This vegetation group is considered to be cleared/modified native vegetation. The three areas have been separated in this report as the species present vary slightly in each area.

## 3.1 Area 1: Proposed Location of the Northwest Waste Rock Dump

### 3.1.1 Flora

Flora recorded in the cleared/modified vegetation group was represented by 14 Families, 20 Genus and 52 Species (Appendix 2).

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* and as listed in Department of Conservation and Land Management (2005) were found in the area surveyed.

No Priority Species as defined in Department of Conservation and Land Management (2005) were located during the survey.

The area has no national environmental significance as defined by the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (Department of Environment and Heritage 2005).

### 3.1.2 Vegetation

The vegetation recorded in this community was representative of cleared/modified vegetation, and was approximately 80ha. There were no single dominant taxa, but species present included a mix of *Eucalyptus* species with a dense Chenopod understorey. Species present included *Eucalyptus flocktoniae, E. lesoueffi, E. diptera, E. campaspe, Ptilotus exaltatus var exaltatus, Codonocarpus cotinifolius, Senna artemisioides ssp artemisioides, S. artemisioides ssp filifolia, Casuarina pauper, Atriplex amnicola, A. bunburyana, A. vesicaria, Maireana brevifolia, M. georgei, M. pentatropis, M. pyramidata, M. sedifolia, M. tomentosa, M. triptera, Sclerolaena cuneata, Solanum orbiculatum, Acacia hemiteles, A. acuminata, A. tetragonophylla, Dodonaea lobulata* and *Solanum lasiophyllum.*

No Broad scale clearing has occurred for agricultural purposes in this community within the survey area. This community occurs within the cleared/modified native vegetation group, which extends a 7.3% cover of the State of Western Australia (ANRA, 2005).

Figure 1: Cleared/modified native vegetation in Area 1.

## 3.2 Area 2: Location of the proposed Northeast Waste Rock Dump

### 3.2.1 Flora

Flora recorded in this cleared/modified vegetation was represented by 24 Families, 35 Genus and 72 Species (Appendix 2).

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* and as listed in Department of Conservation and Land Management (2005) were found in the area surveyed.

No Priority Species as defined in Department of Conservation and Land Management (2005) were located during the survey.

The area has no national environmental significance as defined by the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (Department of Environment and Heritage 2005).

### 3.2.2 Vegetation

The vegetation recorded in this community was representative of cleared/modified vegetation, and was approximately 35ha. There were no single dominant taxa, but species present included a mix of *Eucalyptus* species with a dense Chenopod ground cover. Species present included *Eucalyptus flocktoniae, E. salmonophloia E. lesoueffi, E. diptera, E. campaspe, Ptilotus exaltatus var exaltatus, Eremophila oldfieldii ssp angustifolia, E. alternifolia, E. oppositifolia ssp angustifolia, Codonocarpus cotinifolius, Senna artemisioides ssp artemisioides, S. artemisioides ssp filifolia, Casuarina pauper, Atriplex bunburyana, A. stipitata, A. lindleyi, M. georgei, M. pentatropis, M. pyramidata, M. sedifolia, M. triptera, Sclerolaena patenticuspis, Solanum orbiculatum, Acacia hemiteles, A. acuminata, A. tetragonophylla, Dodonaea lobulata* and *Solanum lasiophyllum.*

No Broad scale clearing has occurred for agricultural purposes in this community within the survey area. This community occurs within the cleared/modified native vegetation group, which extends a 7.3% cover of the State of Western Australia (ANRA, 2005).

Figure 2: Cleared/modified native vegetation in Area 2.

## 3.3 Area 3: Location of the proposed Golden Pike Cutback

### 3.3.1 Flora

Flora recorded in the cleared/modified vegetation was represented by 17 Families, 26 Genus and 56 Species (Appendix 2).

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the Wildlife Conservation Act (1950) and as listed in Department of Conservation and Land Management (2005) were found in the area surveyed.

Two Priority Species as defined in Department of Conservation and Land Management (2005) was located during the survey in this vegetation group. These Priority 4 and Priority 3 species respectively are *Eucalyptus formanii*, and *Eucaluyptus brockwayi.* Approximately 20 individual trees were present of each species. These species were intentionally included into the rehabilitation program for this area and planted as seedlings as part of the "Greening the Golden Mile Rehabilitation Program". These are not considered to be significant natural populations due to their cultivation. Information regarding the presence of these Priority species has been given to Dr. Ken Atkins at the Department of CALM.

The vegetation group has no national environmental significance as defined by the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (Department of Environment and Heritage 2005).

### 3.3.2 Vegetation

The vegetation recorded in this community was representative of cleared/modified native vegetation, and was approximately 46ha. There were no single dominant species as the vegetation was not well established enough. Species present included *Senna cardiosperma, S. artemisioides ssp filifolia, Casuarina pauper, Atriplex bunburyana, A. nummularia, A. stipitata, M. brevifolia, M. georgei, M. pentatropis, M. pyramidata, M. triptera, Salsola tragus, Sclerolaena diacantha, Melia azedarach, Acacia acuminata, A. hemiteles, A. murrayana, A. assimilis, A. ligulata, Eremophila oldfieldii ssp angustifolia, E. longifolia, Myoporum platycarpum, Eucalyptus Campaspe, E. lesoueffi, E. salubris, E. stricklandii, E. torquata, E. diptera, E. brockwayi, Melaleuca armilaris ssp armilaris, Grevillea nematophylla ssp nematophylla* and *Dodonaea lobulata.*

No Broad scale clearing has occurred for agricultural purposes in this community within the survey area. This community occurs within the cleared/modified native vegetation group, which extends a 7.3% cover of the State of Western Australia (ANRA, 2005).

Figure 3: Cleared/modified native vegetation within Area 3.

## 4 Vegetation Condition

The vegetation condition of the vegetation communities within the areas surveyed by Jim's Seeds, Weeds & Trees Pty Ltd is classed as being in a "good" health condition (Keighery, 1994) depicting that the structure was affected by multiple disturbances. Although the structure has been affected, it has the ability to regenerate.

## 5 Significant Species

Two priority species were recorded within the surveyed area. These species, *Eucalyptus formanii* and *Eucalyptus brockwayi* are Priority 4 and Priority 3 listed species respectively and were located within Area 3. These species were intentionally cultivated to seedling stage and planted as part of the "Greening the Golden Mile Rehabilitation Program", and therefore not considered to be significant populations.

## 6 Introduced Species

Fourteen introduced species were recorded in the survey areas. There were *Shinus molle, Phoenix dactylifera, Asphodelus fistulosis, Carrichtera annua, Caesalpinia gilliessii, Pennisetum clandestinum, Stenotaphrum secundatum, Emex australis, Lycium ferrocissimum, Nicotiana glauca, Tamarix aphylla, Carthamus lanatus, Mentha suaveolens* and *Medicago minima*.

Of these introduced species, *Emex australis* (P1, 3, 4, 5), *Tamarix aphylla* (prohibited), *Carthamus lanatus* (P1, 3, 4) are considered by the Department of Agriculture (2005) to be declared weeds under the *Agriculture and Related Resources Protection Act 1976*. The appropriate regional categories are included in Appendix 4 for each.

Currently KCGM have intensive weed control management strategies in place which are aimed at controlling these invasive weeds.

## 7 Discussion

The 161ha of surveyed area revealed one vegetation community comprising a combined total of 29 Families, 51 Genus and 111 Species.

Two of these species *Eucalyptus formanii and Eucalyptus brockwayi,* considered Priority 4 species and Priority 3 respectively, occur within Area 3. These species were not prominent, with approximately 20 individual plants of each present. These are not considered to be significant populations, due to their intentional cultivation and inclusion into the rehabilitation program. The Department of CALM has been contacted about these Priority species and they are aware that these populations are not considered natural populations due to their intentional cultivation.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* and as listed in Department of Conservation and Land Management (2005) were found in the area surveyed.

No vegetation communities recorded within the proposed clearing area which was surveyed are considered to have regional environmental significance as defined by the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (Department of Environment and Heritage 2005).

## 8 Personnel Involved

Jim Williams- Botanist (Diploma in Horticulture)

Eren Reid- Biological Scientist (BSc)

Nicole Garbin- Environmental Scientist (BESc)

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**Appendix 1:** CALM and WAHERB Databases search results for Rare and Priority species within the survey area.

Eremophila praecox ms (P1)
Lepidium fasciculatum (P1)
Ptilotus procumbens (P1)
Elachanthus pusillus (P2)
Gastrolobium crenulatum (P2)
Stylidium sp. Boulder Rock (AH Burbidge 2536) (P2)
Alyxia tetanifolia (P3)
Astartea sp. Bungalbin Hill (KR Newbey 8989) (P3)
Frankenia georgei (P3)
Melaleuca coccinea (P3)
Xanthoparmelia dayiana (P3)

Appendix 2: Species list of the surveyed area.

| Family | | Genus | Species | Area 1 | Area 2 | Area 3 |
|---|---|---|---|---|---|---|
| Amaranthaceae | | Ptilotus | exaltatus var exaltatus | * | * | |
| Amaranthaceae | | Ptilotus | exaltatus var vilosus | * | * | |
| Amaranthaceae | | Ptilotus | obovatus | * | * | |
| Amaranthaceae | | Ptilotus | holosericeus | | * | |
| Anacardiaceae | # | Shinus | molle | | | * |
| Apocynaceae | | Alyxia | buxifolia | | * | |
| Apocynaceae | | Codonocarpus | cotinifolius | * | | |
| Arecaceae | # | Phoenix | dactylifera | | | * |
| Asclepiadaceae | | Marsdenia | australis | | * | |
| Asphodelaceae | # | Asphodelus | fistulosis | | | * |
| Asteraceae | # | Carthamus | lanatus | | * | |
| Asteraceae | | Chrysocephalum | puteale | | * | |
| Asteraceae | | Olearia | muelleri | | * | |
| Boraginaceae | | Halgania | andromedifolia | | * | |
| Brassicaceae | # | Carrichtera | annua | * | * | * |
| Caesalpiniaceae | # | Caesalpinia | gilliessii | | | * |
| Caesalpiniaceae | | Senna | artemisioides ssp artemisioides | * | * | |
| Caesalpiniaceae | | Senna | artemisioides ssp filifolia | * | | * |
| Caesalpiniaceae | | Senna | cardiosperma | | * | * |
| Casuarinaceae | | Casuarina | pauper | * | * | * |
| Chenopodiaceae | | Atriplex | amnicola | * | | |
| Chenopodiaceae | | Atriplex | bunburyana | * | * | * |
| Chenopodiaceae | | Atriplex | holocarpa | * | | |
| Chenopodiaceae | | Atriplex | lindleyi | | * | |
| Chenopodiaceae | | Atriplex | nummularia | * | * | * |
| Chenopodiaceae | | Atriplex | stipitata | * | * | * |
| Chenopodiaceae | | Atriplex | vesicaria | * | | |
| Chenopodiaceae | | Dissocarpus | paradoxus | * | | |
| Chenopodiaceae | | Enchylaena | tomentosa | * | * | |
| Chenopodiaceae | | Eriochiton | sclerolaenoides | | * | |

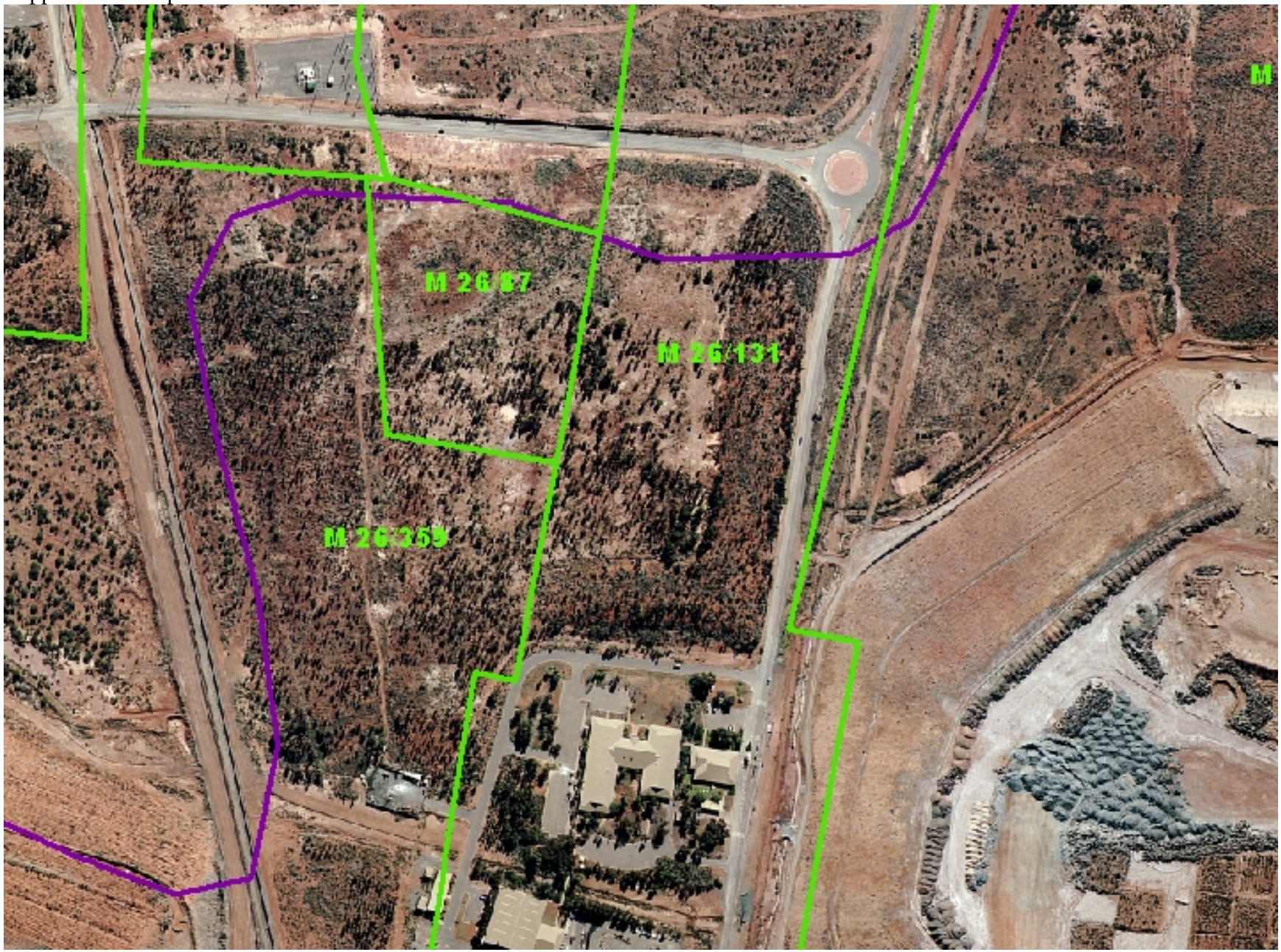
| Family | | Genus | Species | Area 1 | Area 2 | Area 3 |
|---|---|---|---|---|---|---|
| Chenopodiaceae | | Maireana | brevifolia | * | * | * |
| Chenopodiaceae | | Maireana | georgei | * | * | * |
| Chenopodiaceae | | Maireana | pentatropis | * | * | * |
| Chenopodiaceae | | Maireana | platycarpa | | * | * |
| Chenopodiaceae | | Maireana | pyramidata | * | * | * |
| Chenopodiaceae | | Maireana | sedifolia | * | * | * |
| Chenopodiaceae | | Maireana | tomentosa | * | | |
| Chenopodiaceae | | Maireana | trichoptera | * | | |
| Chenopodiaceae | | Maireana | triptera | * | * | * |
| Chenopodiaceae | | Rhagodia | drummondii | | * | |
| Chenopodiaceae | | Salsola | tragus | * | * | * |
| Chenopodiaceae | | Sclerolaena | cuneata | * | | |
| Chenopodiaceae | | Sclerolaena | diacantha | | * | * |
| Chenopodiaceae | | Sclerolaena | patenticuspis | | * | |
| Goodeniaceae | | Scaevola | spinescens | * | * | |
| Lamiaceae | # | Mentha | suaveolens | | * | |
| Lamiaceae | | Westringia | rigida | | * | |
| Loranthaceae | | Amyema | preissii | | * | |
| Malvaceae | | Melia | azedarach | | | * |
| Malvaceae | | Sida | calyxhymenia | * | * | |
| Mimosaceae | | Acacia | acuminata | * | * | * |
| Mimosaceae | | Acacia | assimilis | * | | * |
| Mimosaceae | | Acacia | colletioides | * | * | |
| Mimosaceae | | Acacia | erinacea | * | * | |
| Mimosaceae | | Acacia | hemiteles | * | * | * |
| Mimosaceae | | Acacia | jennerae | * | | * |
| Mimosaceae | | Acacia | ligulata | | | * |
| Mimosaceae | | Acacia | microbotrya | * | | |
| Mimosaceae | | Acacia | murrayana | * | * | * |
| Mimosaceae | | Acacia | oswaldii | | | * |
| Mimosaceae | | Acacia | tetragonophylla | * | * | |
| Mimosaceae | | Acacia | victoriae | * | * | * |

| Family | | Genus | Species | Area 1 | Area 2 | Area 3 |
|---|---|---|---|---|---|---|
| Myoporaceae | | Eremophila | alternifolia | | * | |
| Myoporaceae | | Eremophila | glabra | | * | |
| Myoporaceae | | Eremophila | longifolia | | | * |
| Myoporaceae | | Eremophila | oldfieldii ssp angustifolia | * | * | * |
| Myoporaceae | | Eremophila | oppositifolia ssp angustifolia | | * | |
| Myoporaceae | | Eremophila | parvifolia ssp auricampa | | * | |
| Myoporaceae | | Eremophila | pustulata | | * | |
| Myoporaceae | | Eremophila | scoparia | | * | |
| Myoporaceae | | Myoporum | platycarpum | | | * |
| Myrtaceae | | Callistemon | phoeniceus | * | | |
| Myrtaceae | | Eucalyptus | brockwayi P3 | | | * |
| Myrtaceae | | Eucalyptus | camaldulensis | * | | * |
| Myrtaceae | | Eucalyptus | campaspe | * | * | * |
| Myrtaceae | | Eucalyptus | diptera | * | | * |
| Myrtaceae | | Eucalyptus | dundasii | | | * |
| Myrtaceae | | Eucalyptus | eremophila | | | * |
| Myrtaceae | | Eucalyptus | erythronema | | | * |
| Myrtaceae | | Eucalyptus | flocktoniae | * | | |
| Myrtaceae | | Eucalyptus | formanii P4 | | | * |
| Myrtaceae | | Eucalyptus | griffithsii | * | * | |
| Myrtaceae | | Eucalyptus | lesouefii | * | * | * |
| Myrtaceae | | Eucalyptus | ravida | | * | |
| Myrtaceae | | Eucalyptus | salmonophloia | | * | |
| Myrtaceae | | Eucalyptus | salubris | * | * | * |
| Myrtaceae | | Eucalyptus | stricklandii | | * | * |
| Myrtaceae | | Eucalyptus | torquata | | * | * |
| Myrtaceae | | Eucalyptus | torwood | * | | * |
| Myrtaceae | | Eucalyptus | transcontinentalis | | * | |
| Myrtaceae | | Eucalyptus | woodwardii | | | * |
| Myrtaceae | | Melaleuca | armillaris ssp armillaris | | | * |
| Papilionaceae | # | Medicago | minima | | * | |
| Pittosporaceae | | Pittosporum | angustifolium | | * | |

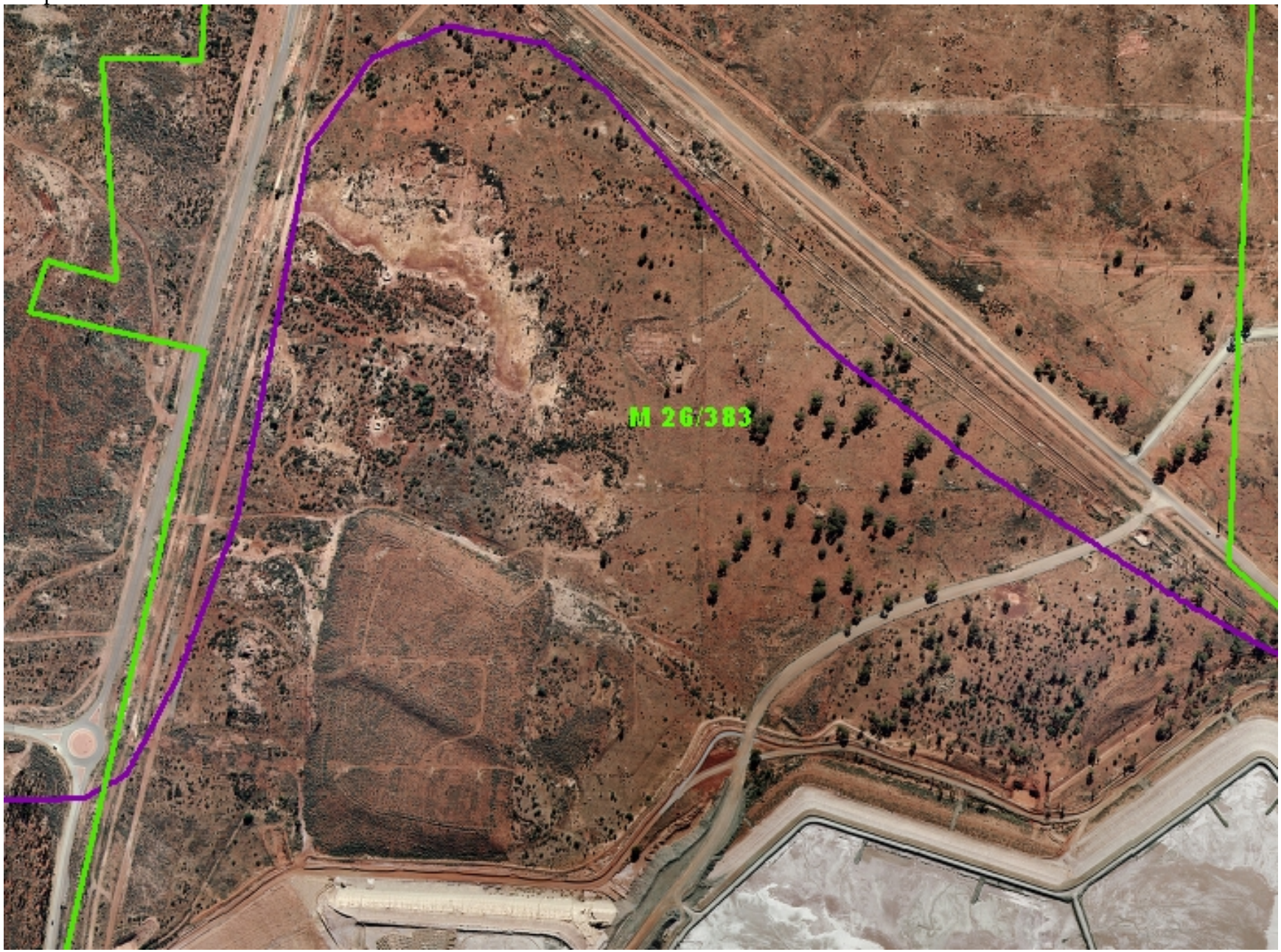
| Family | | Genus | Species | Area 1 | Area 2 | Area 3 |
|---|---|---|---|---|---|---|
| Poaceae | | Austrostipa | elegantissima | | * | |
| Poaceae | | Austrostipa | nitida | | * | |
| Poaceae | # | Pennisetum | clandestinum | | | * |
| Poaceae | # | Stenotaphrum | secundatum | | | * |
| Polygonaceae | # | Emex | australis | | | * |
| Proteaceae | | Grevillea | nematophylla ssp nematophylla | | * | * |
| Santalaceae | | Exocarpos | aphyllus | | * | |
| Santalaceae | | Santalum | acuminatum | | * | |
| Sapindaceae | | Alectryon | oleifolius ssp canescens | | | * |
| Sapindaceae | | Dodonaea | lobulata | * | * | * |
| Solanaceae | | Lycium | australe | | * | |
| Solanaceae | # | Lycium | ferrocissimum | | * | * |
| Solanaceae | # | Nicotiana | glauca | | | * |
| Solanaceae | | Solanum | lasiophyllum | * | * | |
| Solanaceae | | Solanum | orbiculatum | * | * | |
| Tamaricaceae | # | Tamarix | aphylla | | | * |
| Zygophyllaceae | | Zygophyllum | eremaeum | * | * | |

# Denotes weed species

Appendix 3: Map of Area 1



Map of Area 2



Map of Area 3

Appendix 4: Weed control code definitions

## Doublegee (Emex australis and Emex spinosa)

**See also:** Control Method | Weed description | Declared plants list

**Category:** P1
**Location:** For the municipal districts of Augusta-Margaret River (S), Boyup Brook (S), Bridgetown-Greenbushes (S), Bunbury (C), Busselton (S), Capel (S), Collie (S), Dardanup (S), Donnybrook-Balingup (S), Dumbleyung (S), Harvey (S), Katanning (S), Mandurah (C), Manjimup (S), Murray (S), Nannup (S), Serpentine-Jarrahdale (S), Tambellup (S), Wagin (S), Waroona (S), Woodanilling (S).

**Category:** P1, P3
**Location:** For the municipal districts of Broomehill (S), Kojonup (S), West Arthur (S).

**Category:** P1, P4
**Location:** For the municipal districts of Jerramungup (S), Kent (S), Ravensthorpe (S).

**Category:** P5
**Location:** For the municipal districts of Esperance (S), Gnowangerup (S), Kondinin (S), Kulin (S), Lake Grace (S).

Standard Control Codes (these may vary for individual plants)

| | |
|---|---|
| **P1**<br><br>**REQUIREMENTS**<br><br>Prohibits movement | The movement of plants or their seeds is prohibited within the State.<br><br>This prohibits the movement of contaminated machinery and produce including livestock and fodder. |
| **P3**<br><br>**REQUIREMENTS**<br><br>Aims to control infestation by reducing area and/or density of infestation | The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.<br><br>Treat to destroy and prevent seed set all plants:-<br><br>• Within 100 metres inside of the boundaries of the infestation<br>• within 50 metres of roads and highwater mark on waterways<br>• within 50 metres of sheds, stock yards and houses<br><br>Treatment must be done prior to seed set each year.<br><br>Of the remaining infested area:- |

| | |
|---|---|
| | Where plant density is 1-10 per hectare treat 100% of infestation.<br><br>Where plant density is 11-100 per hectare treat 50% of infestation. Where plant density is 101-1000 per hectare treat 10% of infestation.<br><br>Properties with less than 2 hectares of infestation must treat the entire infestation.<br><br>Additional areas may be ordered to be treated. |
| **P4**<br><br>**REQUIREMENTS**<br><br>Aims to prevent infestation spreading beyond existing boundaries of infestation. | The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.<br><br>Treat to destroy and prevent seed set all plants:-<br><br>• within 100 metres inside of the boundaries of the infested property<br>• within 50 metres of roads and highwater mark on waterways<br>• within 50 metres of sheds, stock yards and houses<br><br>Treatment must be done prior to seed set each year. Properties with less than 2 hectares of infestation must treat the entire infestation.<br><br>Additional areas may be ordered to be treated. |
| **Special considerations** | In the case of P4 infestations where they continue across property boundaries there is no requirement to treat the relevant part of the property boundaries as long as the boundaries of the infestation as a whole are treated. There must be agreement between neighbours in relation to the treatment of these areas . |
| **P2**<br><br>**REQUIREMENTS**<br><br>Aim is to eradicate infestation | Treat all plants to destroy and prevent propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seed or plant parts on or in livestock, fodder, grain, vehicles and/or machinery. |

## Saffron thistle (*Carthamus lanatus*)

**See also:** Control Method | Weed description | Declared plants list

**Category:** P3
**Location:** For the municipal districts of Albany (C), Augusta-Margaret River (S), Broomehill (S), Bunbury (C), Busselton (S), Capel (S), Carnamah (S), Collie (S), Coorow (S), Cranbrook (S), Cunderdin (S), Dardanup (S), Denmark (S), Donnybrook-Balingup (S), Dowerin (S), Dumbleyung (S), Gnowangerup (S), Harvey (S), Katanning (S), Kellerberrin (S), Kojonup (S), Koorda (S), Mandurah (C), Mount Marshall (S), Murray (S), Plantagenet (S), Serpentine-Jarrahdale (S), Tambellup (S), Tammin (S), Trayning (S), Wagin (S), Waroona (S), West Arthur (S), Woodanilling (S), Wyalkatchem (S).

**Category:** P1
**Location:** for the whole of the State

**Category:** P4
**Location:** For the municipal districts of Ashburton (S), Beverley (S), Boddington (S), Brookton (S), Broome (S), Bruce Rock (S), Carnarvon (S), Chittering (S), Coolgardie (S), Corrigin (S), Cuballing (S), Cue (S), Dalwallinu (S), Dandaragan (S), Derby-West Kimberley (S), Dundas (S), East Pilbara (S), Esperance (S), Exmouth (S), Gingin (S), Goomalling (S), Halls Creek (S), Jerramungup (S), Kalgoorlie/Boulder (C), Kent (S), Kondinin (S), Kulin (S), Lake Grace (S), Laverton (S), Leonora (S), Meekatharra (S), Menzies (S), Merredin (S), Moora (S), Mount Magnet (S), Mukinbudin (S), Murchison (S), Narembeen (S), Narrogin (S), Ngaanyatjarraku (S), Northam (S), Northam (T), Nungarin (S), Pingelly (S), Port Hedland (T), Quairading (S), Ravensthorpe (S), Roebourne (S), Sandstone (S), Shark Bay (S), Toodyay (S), Upper Gascoyne (S), Victoria Plains (S), Wandering (S), Westonia (S), Wickepin (S), Williams (S), Wiluna (S), Wongan-Ballidu (S), Wyndham-East Kimberley (S), Yalgoo (S), Yilgarn (S), York (S).

Standard Control Codes (these may vary for individual plants)

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| **P1**<br><br>**REQUIREMENTS**<br><br>Prohibits movement | The movement of plants or their seeds is prohibited within the State.<br><br>This prohibits the movement of contaminated machinery and produce including livestock and fodder. |
| **P3**<br><br>**REQUIREMENTS**<br><br>Aims to control infestation by reducing area and/or density of infestation | The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.<br><br>Treat to destroy and prevent seed set all plants:-<br><br>• Within 100 metres inside of the boundaries of the infestation<br>• within 50 metres of roads and highwater mark on waterways |

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| | • within 50 metres of sheds, stock yards and houses<br><br>Treatment must be done prior to seed set each year.<br><br>Of the remaining infested area:-<br><br>Where plant density is 1-10 per hectare treat 100% of infestation.<br><br>Where plant density is 11-100 per hectare treat 50% of infestation. Where plant density is 101-1000 per hectare treat 10% of infestation.<br><br>Properties with less than 2 hectares of infestation must treat the entire infestation.<br><br>Additional areas may be ordered to be treated. |
| **P4**<br><br>**REQUIREMENTS**<br><br>Aims to prevent infestation spreading beyond existing boundaries of infestation. | The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery.<br><br>Treat to destroy and prevent seed set all plants:-<br><br>• within 100 metres inside of the boundaries of the infested property<br>• within 50 metres of roads and highwater mark on waterways<br>• within 50 metres of sheds, stock yards and houses<br><br>Treatment must be done prior to seed set each year. Properties with less than 2 hectares of infestation must treat the entire infestation.<br><br>Additional areas may be ordered to be treated. |
| **Special considerations** | In the case of P4 infestations where they continue across property boundaries there is no requirement to treat the relevant part of the property boundaries as long as the boundaries of the infestation as a whole are treated. There must be agreement between neighbours in relation to the treatment of these areas . |

## Athel pine (Tamarix aphylla)

**See also:** Declared plants list

**Category:** P1
**Location:** for the whole of the State

Standard Control Codes (these may vary for individual plants)

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| **P1**<br><br>**REQUIREMENTS**<br><br>Prohibits movement | The movement of plants or their seeds is prohibited within the State.<br><br>This prohibits the movement of contaminated machinery and produce including livestock and fodder. |