

Interim Recovery Plan No. 14

INTERIM RECOVERY PLAN NO. 14

**METALLIC FLOWERED EREMOPHILA  
(*EREMOPHILA VENETA* MS) INTERIM  
RECOVERY PLAN**

**1996-1999**

by

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## **FOREWORD**

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (CALM) Policy Statements Nos 44 and 50. IRPs are designed to run for three years only and will be replaced by full Recovery Plans where required.

IRPs outline the recovery actions that are required to urgently address those threatening processes most affecting the ongoing survival of threatened taxa or ecological communities, and begin the recovery process.

CALM is committed to ensuring that Critically Endangered taxa are conserved through the preparation and implementation of Recovery Plans or Interim Recovery Plans and by ensuring that conservation action commences as soon as possible and always within one year of endorsement of that rank by the Minister.

This IRP was approved by the Director of Nature Conservation on 7 May 1997. Approved IRPs are subject to modification as dictated by new findings, changes in status of the taxon or ecological community and the completion of recovery actions. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at March 1997.

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## SUMMARY

**Metallic-Flowered Eremophila, *Eremophila veneta* ms Family:****MYOPORACEAE****Flowering period:** October-December**CALM Region:** Wheatbelt      **CALM Districts:** Katanning, Narrogin**Shires:** Corrigin, Gnowangerup, Kent, Kondinin, Kulin, Lake Grace**Current status:** Declared as Rare Flora in May 1991, ranked as Critically Endangered in September 1995**Recovery teams:** Threatened Flora Recovery Teams will be established in the Katanning and Narrogin Districts in 1997**Illustrations and/or further information:** S. Hopper, *et al. Western Australia's Endangered Flora* (1990); G. Durell *et al. Narrogin District Threatened Flora Management Program* (in prep.); M. Graham *Katanning District Threatened Flora Management Program* (in prep).

*Eremophila veneta* ms is a low, open shrub to 60 cm high and 1 m in diameter with metallic blue-green flowers. It is known from approximately 170 plants in nine mostly small populations, spread over a distance of 175 km from north of Kondinin to west of Ongerup. Four populations are on narrow, degraded road reserves, one on a railway reserve, one on a Shire reserve and three on nature reserves. Two nature reserve populations are by far the most substantial.

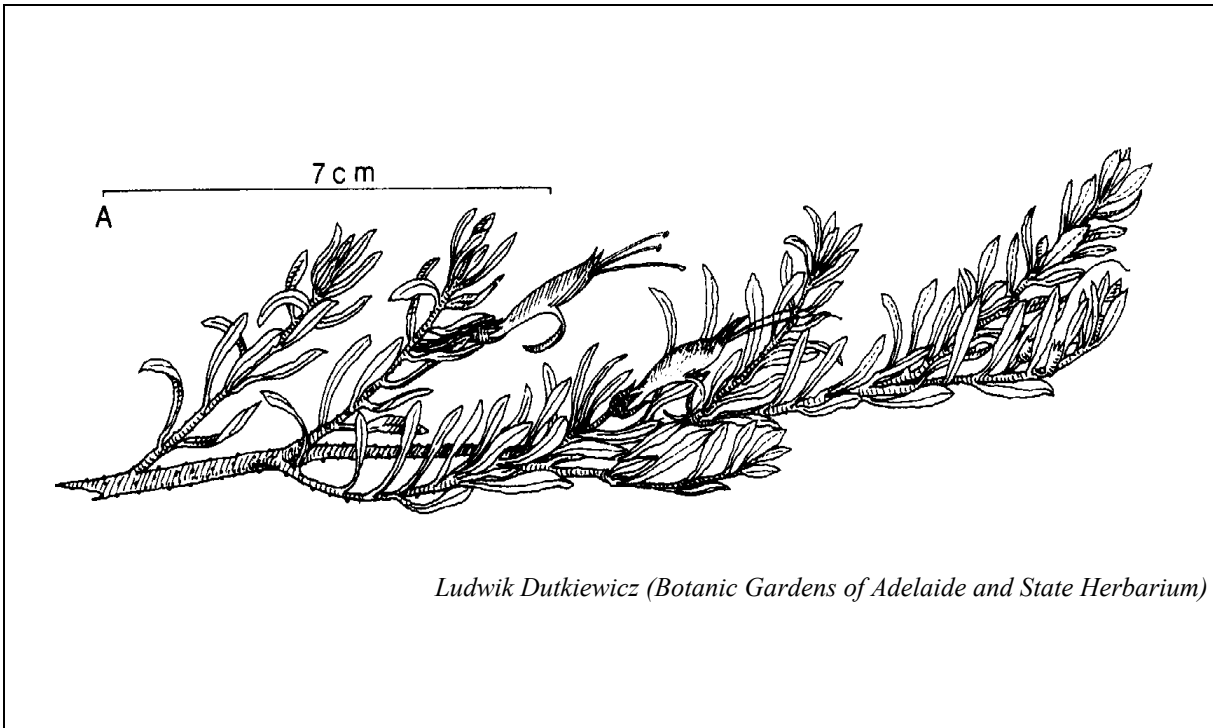
The species was first found in 1962 by K. Newbey (north-west of Ongerup) and F. Lullfitz (east of Gorge Rock). It was then not seen again until 1976 when L. Haegi found a population east of Bendering Railway Siding. In 1981, R.J. Chinnock found a further population, north of Ongerup. Since then, there have been only three further populations found, one by K.J. Atkins in 1990 (south-east of Kulin), one in 1994 by M. Graham (west of Pingrup) and one by S Murray south-east of Kulin in a Shire reserve vested for the purpose of conservation of flora. A specimen from the latter area was confirmed in March 1996. Two new subpopulations of *Eremophila veneta* ms were discovered by E. Holland and K. Kershaw in December 1995 during the survey phase of this Interim Recovery Plan (IRP). Both are in nature reserves.

All roadside populations are exposed to threats associated with weed invasion, agricultural chemical drift, grazing and road maintenance activities. Populations located on nature reserves and a railway reserve are exposed to threats associated with firebreak maintenance, salinity, inappropriate fire regimes, erosion and the encroachment of weeds. The aim of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations of *Eremophila veneta* ms in order to conserve the wild genetic stock of this species. To achieve this aim the following essential and desirable recovery actions are prescribed.

**Recovery actions:**

Essential	Desirable
1. Install Declared Rare Flora (DRF) markers	1. Conduct further surveys
2. Implement weed control	2. Information dissemination
3. Develop a fire management plan	3. Preserve genetic diversity of the species
4. Monitor populations	4. Conduct research
	5. Habitat rehabilitation
	6. Translocation

*Eremophila veneta* ms



**Distribution of *Eremophila veneta* ms**  
**Illustration not available**

## 1. BACKGROUND

### 1.1 History, taxonomy and status

*Eremophilas* are commonly known as poverty bushes, emu bushes and desert fuchsias. The resin of some *Eremophila* species was used by Aborigines as a form of glue and for tanning kangaroo and possum skins. Approximately 180 species of *Eremophila* are found in Western Australia, 14 have been declared rare, a further 50 have been priority listed and one wheatbelt species is presumed extinct (Department of CALM 1995).

*Eremophila veneta* ms is a low, open shrub to 60 cm high and 1 m in diameter with glandular-resinous branches and densely-clustered, inversely lanceolate leaves. Flowers are solitary, supported by a long flattened pedicel 3-4.5 mm in length. Flowers are metallic blue-green, yellow below, and inside. Lobes of the upper lip are close together and the corolla 17-18 mm long (Narrogin District Threatened Flora Management Program, in prep.).

A full taxonomic description of *Eremophila veneta* ms will be provided by Dr. R.J. Chinnock when he formally describes the species in 1997. This work is still in draft, however, a copy is included in Appendix 1.

*Eremophila veneta* ms was first collected by K. Newbey (north-west of Ongerup) and F. Lullfitz (east of Gorge Rock) in 1962. It was then not seen again until 1976 when L. Haegi found a population east of Bendering Railway Siding. In 1981, R.J. Chinnock found another population, north of Ongerup. Between 1986-1988 extensive surveys were carried out by R.J. Chinnock and M. Graham, with no further populations being found.

Since 1988, three more populations have been discovered, one by K.J. Atkins in 1990 (south-east of Kulin), one in 1994 by M. Graham (west of Pingrup) and one by S. Murray south-east of Kulin in a Shire reserve vested for the purpose of conservation of flora. A specimen from the latter area was confirmed in March 1996. Additionally, in December 1995 two new subpopulations of *Eremophila veneta* ms were discovered by E. Holland and K. Kershaw during the survey phase of this Interim Recovery Plan (IRP). Both were found in nature reserves, one south-east of Kulin and the other south of Newdegate. Currently 170 plants are known from nine populations between Kondinin and Ongerup.

*E. veneta* ms appears to be restricted to a specific habitat type, most of which has been cleared for farming. Due to the small size of most populations and little remaining suitable habitat, much of which is vulnerable to weed invasion and destruction from road maintenance activities, fire and grazing, *Eremophila veneta* ms was declared as Rare Flora in May 1991 and ranked as Critically Endangered in September 1995. Threatened Flora Recovery Teams will be established in the Narrogin and Katanning Districts in 1996/97.

### 1.2 Distribution and habitat

*Eremophila veneta* ms is known from nine populations, scattered over a distance of 175 km from north of Kondinin to west of Ongerup.

This species occurs on white sandy-clay flats under low *Eucalyptus* woodland over open shrub mallee of *Eucalyptus annulata*, and open dwarf scrub of *Atriplex* sp., *Rhagodia preissii*, *Acacia merrallii* and *Enchylaena tomentosa*.

Other associated species are listed in Appendix 2.

**Table 1: Summary of population information**

<b>Pop. No &amp; Location.</b>	<b>Land Status</b>	<b>No. of plants.</b>	<b>Condition</b>	<b>Threats</b>
1. East of Buniche Wheat Bin	Railway Reserve	1990, 6 1995, 12	Healthy	Weeds, salinity, accidental destruction and fire
2a. Hopkins Nature Reserve	Nature Reserve, Class C	1990, 2 1995, 5	Moderate	Fire, water and soil erosion
2b. Hopkins Nature Reserve	Nature Reserve, Class C	1991, 8 1995, 30	Healthy	Weeds and fire
2c. Hopkins Nature Reserve	Nature Reserve, Class C	1995, 23	Healthy	Roadworks and fire
3. East of Kondinin	Shire Road Reserve	1995, 7	Moderate	Roadworks, grazing, weeds and fire
4. Lockhart Nature Reserve	Nature Reserve, Class A	1993, 12 1995, 72	Healthy	Accidental destruction, fire and salinity
5. West of Pingrup	Shire Rd. Reserve	1993, 2 1995, 2	Healthy	Recreational activities, roadworks, weeds, salinity and fire
6. Bendinger Nature Reserve	Nature Reserve, Class A	1995, 4	Healthy	Accidental destruction, weeds and fire
7. East of Gorge Rock	Shire Road Reserve	1995, 6	Moderate	Roadworks, grazing, weeds and fire
8. North of Ongerup	Shire Road Reserve	1981, 12 1995, 7	Moderate	Roadworks, grazing, weeds and fire
9. SE of Kulin	Shire Reserve, Native Flora	1995, 1	Healthy	Roadworks, grazing, weeds and fire

### 1.3 Biology and ecology

Many *Eremophila* species are regarded as disturbance opportunists as they appear in large numbers following roadworks, partial clearing or fire, then gradually disappear over several years. Following damage or destruction of the aerial parts of the parent plant, suckering is the most obvious form of *Eremophila* regeneration in disturbed sites. Germination of *Eremophila* species from soil stored seed is also common after roadside disturbance and may be due to a reduction in competition from other flora and the increased soil-moisture status along roadside reserves (Chinnock 1986).

Like other *Eremophila* species, *Eremophila veneta* ms is probably a disturbance opportunist. Plants in three populations were found growing on firebreaks and three populations occur along drainage lines. Little is currently known about the ecology and life history of this species.

Observations made by staff of CALM's Threatened Flora Seed Centre (TFSC) in February 1996, showed that many *E. veneta* ms fruit had either not formed or had aborted. It was also discovered that ants were taking *E. veneta* ms seeds to their nests, where they were deposited around the edge of the entrance hole.

### 1.4 Threatening processes

#### 1.4.1 Causes of the Critically Endangered status of this species

The rarity of *E. veneta* ms is probably due to the loss of habitat from wide scale clearing for agriculture. Only small remnants of uncleared native vegetation remain in the wheatbelt areas between Kondinin and Ongerup.

Reproductive factors may also contribute to the plant's low numbers due to the low levels of viable seed that are produced. *E. veneta* ms is thought to be a disturbance opportunist and the low numbers of natural fires that have occurred in the areas of known populations, may have contributed to poor seedling recruitment and regeneration.



#### 1.4.2 Threats to the ongoing survival of this species in the wild

- **Weed invasion** is a threat to rail and road reserve populations all of which are being invaded by weed seeds blown in from adjoining pasture. Weeds suppress early plant growth by competing for soil moisture, nutrients and light and also exacerbate grazing pressure. Populations which are restricted to narrow road and rail reserves (populations 1, 3, 5, 7, and 8), experience high perimeter to area ratios. This results in virtually the whole corridor being subjected to influences of the adjacent land, commonly referred to as edge effect (Lynch 1987; Saunders *et al.* 1987; Taylor 1987). Effects include increased wind speed, increased fertiliser runoff, modified hydrology and altered disturbance regimes, including fire.
- **Road maintenance** has threatened one road reserve population in the past and construction of drainage channels, grading activities and other road maintenance activities are potentially future threats. Relevant authorities need to be informed of recently discovered road reserve populations and appropriate protective measures carried out. The adjacent landowners should be informed of this species presence, so as to prevent possible grazing damage (ie. if road reserves are used for grazing in times of poor feed).
- **Fire** must be excluded from all populations until its effect is better understood. High fire frequency commonly leads to degradation of natural plant communities due to factors such as depletion of soil seed banks and a temporary increase in the availability of nutrients for weed establishment (Panetta and Hopkins 1991).
- **Salinity and soil erosion** will need to be monitored at several population sites (1, 2a and 4).

#### 1.5 Conservation status

*Eremophila veneta* ms is known from four populations on narrow, degraded road reserves, one on a railway reserve, three on nature reserves and one on a Shire reserve.

Two of the three populations found on nature reserves are by far the most substantial, these being Lockhart Nature Reserve, Class A, for the purpose of Conservation of Flora and Fauna and Hopkins Nature Reserve Class C, for the purpose of Conservation of Flora. The other population occurs on Bendering Nature Reserve Class A, for the purpose of Conservation of Flora and Fauna. All nature reserve populations are vested in the National Parks and Nature Conservation Authority.

#### 1.6 Strategy for recovery

The following essential strategies will be implemented:

1. Control of the most threatening factors currently affecting *E. veneta* ms as outlined in 3.2.
2. Ensure that relevant land managers and CALM personnel are aware of the presence of *E. veneta* ms and the need to protect it (eg. notification and roadside markers), and ensure that all are familiar with the threatening processes identified in these guidelines (see 3.2.5).
3. Threatened Flora Recovery Teams will be established for the Katanning and Narrogin Districts in 1997. The Recovery Teams will oversee the implementation of this IRP and report annually to CALM's Corporate Executive.

The following desirable strategies will be implemented if resources permit:

1. Protect *E. veneta* ms from possible future threats by appropriate management practices (see 3.3).
2. Enhance plant numbers (eg. by removal of a limiting factor or with direct propagation and translocation techniques (see 3.3.4), and CALM Policy Statement No 29 on Translocation of Threatened Flora and Fauna).
3. Preserve genetic material of *E. veneta* ms by including it in a seed bank, cryostorage and/or *ex situ* cultivation (see 3.3.1).
4. Research into the biology, ecology and management of *E. veneta* ms (see 3.3.2).

## 2. RECOVERY OBJECTIVE AND CRITERIA

### 2.1 Objective

The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long term conservation of this species in the wild.

## **2.2 Criteria**

### **2.2.1 Criteria for success**

Recovery will be deemed a success if threatening processes identified within this IRP have been reduced or removed within the three year period.

### **2.2.2 Criteria for failure**

The recovery process will have been unsuccessful if identified threats have not abated within the three year period of this IRP or there has been a substantial decrease in the number of mature plants.

## **3. RECOVERY ACTIONS**

### **3.1 Existing recovery actions**

Declared Rare Flora (DRF) markers have been erected for populations 1 and 5. These alert road maintenance workers to the presence of each population, and enable them to take appropriate care.

CALM's Science and Information Division (SID) is undertaking research into weed control in populations 7 and 3.

Cutting material was collected by Kings Park and Botanic Garden (KPBG) staff in 1991 which has produced eight plants in good health. A small amount of seed was collected from subpopulations 2a, 2b and population 7 by CALM's Threatened Flora Seed Centre (TFSC) in February, 1996.

### **3.2 Essential recovery actions**

#### **3.2.1 Install Declared Rare Flora Markers**

DRF markers are in place for population 1, but one of these needs to be moved west 150 metres to encompass several recently discovered plants. One DRF marker has fallen over and needs to be re-erected.

DRF markers need to be put in place for the following populations:

- Subpopulation 2c, which was recently discovered along Hopkins Road.
- Population 3, which occurs on both sides of the Kondinin-Hyden Road, east of Kondinin (one plant occurs on the north road verge and six plants on the south side).
- Population 4, which is partially growing along a firebreak in Lockhart Nature Reserve. Markers are required to prevent accidental destruction during firebreak maintenance.
- Population 6, which is growing along a firebreak and drainage line in Bendering Nature Reserve. Markers are required to prevent accidental destruction during firebreak maintenance.
- Population 7, which is east of Gorge Rock on the north side of the road only.
- Population 8, which is west of Ongerup, along both sides of a narrow road reserve.

For all the above populations, it is recommended that DRF markers are positioned up to 50 m either side of the population boundary to provide a habitat buffer and allow seedling recruitment.

Action:	Install DRF markers
Responsibility:	CALM (Katanning and Narrogin Districts, Western Australian Threatened Species and Communities Unit (WATSCU))
Cost:	\$1200

### 3.2.2 Implement weed control

Populations 3, 7 and 8 are affected by the massive invasion of wild oats and other introduced grass species. All require weed control but, as the tolerance of native plant species to herbicides at *E. veneta* ms sites is unknown, it is recommended that this be undertaken in conjunction with research (see 3.3.2). The aim of weed control is to maintain the pre-invasion condition of the habitat (prevention), control or arrest ongoing weed invasion (intervention) and reverse the degraded condition of the habitat where applicable (rehabilitation) (Panetta and Hopkins, 1991). A weed control program will involve:

1. Accurately mapping the boundaries of the populations.
2. Selection of an appropriate herbicide or other method of weed control after determining which weeds are present.
3. Controlling invasive weeds internal to the boundary by hand removal and spot spraying around individual *E. veneta* ms plants when weeds first emerge.
4. Scheduling to include weed spraying of other Declared Rare Flora populations requiring weed control within the Katanning and Narrogin Districts.

Populations 3, 7 and 8 are on road reserves vested with three different Shires (Kondinin, Corrigin and Gnowangerup). Accordingly, weed control is partially the responsibility of these agencies. However, it is recommended that a weed control program for this critically endangered species be developed by CALM in consultation with each Shire. Such a program should be implemented in autumn/winter 1997 and be ongoing.

Action: Control weeds at populations 3, 7 and 8  
Responsibility: CALM (Katanning and CALM Narrogin Districts, WATSCU, SID)  
Cost: \$750 pa.

### 3.2.3 Develop a fire management plan

A recently discovered population (population. 9), which consisted of a single plant, was burnt during a wildfire in January 1996. As the fire response of this species has never been studied, this is a good site to monitor its effect (see 3.3.2). Until this has been done, and more is known about the effect of fire on this species, all populations need to be protected against such an event. A weed control program for populations 3, 7 and 8 will decrease the potential fire hazard that weeds create over the summer period.

CALM Katanning and CALM Narrogin personnel will hold on-site meetings with representatives from relevant Shires, authorities and land managers to outline the problems associated with inappropriate fire.

Action: Develop a fire management plan  
Responsibility: CALM (Katanning and Narrogin Districts, WATSCU), relevant authorities and land managers  
Cost: \$500 pa.

### 3.2.4 Monitor populations

Monitoring of factors such as weed encroachment, response to fire, habitat degradation, population stability (expanding or declining), pollination activity, seed production, recruitment, and longevity is prescribed.

All populations will be inspected annually as a requirement under CALM's Policy Statements, No. 9 *Conservation of Threatened Flora in the Wild* and No 28 *Reporting Monitoring and Re-evaluation of Ecosystems and Ecosystem Management*. See also below 3.3.4, *Development of a Quadrat/Transect Based Monitoring System For Threatened Plant Species*.

Action: Monitor populations  
Responsibility: CALM (Katanning and Narrogin Districts, WATSCU, SID)  
Cost: \$500 pa.

## 3.3 Desirable recovery actions

### 3.3.1 Conduct further surveys

Areas of suitable habitat, particularly in reserves will be further surveyed on a systematic basis for the presence of this species. This should be conducted by CALM district staff and be carried out during the flowering period (October -December).

Action: Conduct further surveys  
Responsibility: CALM (Katanning and Narrogin Districts, WATSCU), Newdegate Rare Flora Volunteer Group  
Cost: \$1100 for 1st year, \$650 for 2nd and 3rd year

### 3.3.2 Information dissemination

To promote an awareness of *E. veneta* among relevant CALM staff, local government staff and members of the public, the production of vehicle dashboard stickers and posters is recommended. Dashboard stickers should illustrate a rare flora marker and provide a contact telephone number if one is encountered. Posters should illustrate and provide information on the species. Shire staff should be briefed about the need to check threatened flora records before arranging burns, road maintenance or undertaking clearing operations.

The importance of biodiversity conservation and the preservation of critically endangered species need to be promoted to the general public, however, it is recommended that the exact location of populations of *E. veneta* remain confidential. Awareness can be encouraged throughout the community by a publicity campaign using the local print and electronic media and by setting up poster displays in venues of high exposure. Formal links with local naturalist groups and interested individuals should also be encouraged. Such activities may lead to the discovery of new populations of the species.

Hopkins Nature Reserve has had the nature reserve signs removed or damaged. These need to be replaced.

Action: Produce posters and dashboard stickers, implement a publicity campaign  
Responsibility: CALM (Corporate Relations Division, Katanning and Narrogin Districts, WATSCU)  
Cost: \$500 first year, \$1500 second year

### 3.3.3 Preserve genetic diversity of the species

Germplasm collections should be given a high priority if the extinction of populations *E. veneta* is considered a high probability through disease, its limited distribution or low number of plants. If this is deemed to be the case, recovery of the species is likely to need *ex situ* conservation techniques.

Genetic diversity conservation of the species should be incorporated into the research component (see 3.3.4) and should include collection of seed from all populations, ensuring an adequate representation of genetic diversity.

If it is not possible to collect adequate quantities of viable seed, other more costly germplasm storage methodologies may need to be investigated. These can involve living collections from cutting or other source material, or storage of tissue culture material. If resources are limited these techniques will need to be carefully prioritised in relation to *in situ* conservation. This will be coordinated by the soon to be formed Katanning and Narrogin District Threatened Flora Recovery Teams (KDTFRT, NDTFRT).

It is also important that the size and viability of the soil seed bank is determined and research undertaken to develop techniques for stimulating germination of soil stored seed. Care, however, should be taken as these processes inherently carry a significant risk of depletion of seed bank reserves.

Action: Preserve genetic diversity of the species  
Responsibility: KDTFRT, NDTFRT (both to be established), CALM (TFSC, Katanning and Narrogin Districts), KPBG  
Cost: \$1600

### 3.3.4 Conduct research

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Research designed to increase understanding of the biology of the species will provide a scientific base for management of *Eremophila veneta* ms in the wild. Research should include:

1. The effect of weeds on recruitment and establishment.
2. Habitat response to herbicide treatments.
3. Pollination biology and seed set.
4. The factors determining level of flower and fruit abortion.
5. Quantification of level of invertebrate grazing of seed.
6. The size and viability of the seed bank.
7. Seed germination requirements.
8. The role of disturbance in regeneration.
9. The longevity of plants, and time taken to reach maturity.
10. The species sensitivity to fire and response to different fire regimes. This would provide valuable information on the consequences to the populations of uncontrolled or unplanned fire events.
11. The extent of genetic variation within and between populations (essential if new populations are to be established).
12. The development of a monitoring system. Specific protocols for rare flora will be outlined in a future CALM discussion paper *Development of a Quadrat/Transect Based Monitoring System For Threatened Plant Species*, D. Coates, P. Pigott and A. Brown (in prep).

Action: Conduct research  
Responsibility: CALM (SID, Katanning and Narrogin Districts, WATSCU)  
Cost: \$1000 first year, \$2000 second year

### 3.3.5 Habitat rehabilitation

Rehabilitation of *Eremophila veneta* ms habitat by re-introduction of local native plant species into the areas of populations 3, 7 and 8 is recommended. This would ideally include acquisition of a strip of adjoining farmland for road reserve populations. Due to massive weed invasion, it is proposed that in conjunction with Research (3.3.4) and Weed Control (3.2.2), the area between known plants be lightly scarified, removing weeds and possibly stimulating the soil seed bank.

Action: Rehabilitate habitat of populations 3, 7 and 8  
Responsibility: CALM (Katanning and Narrogin Districts, WATSCU)  
Cost: \$1500

### 3.3.6 Translocation

Information on the translocation of threatened animals and plants in the wild is provided in CALM Policy Statement No 29. Surveying potential habitats for possible future translocation sites is recommended within the scope of IRPs, with actual translocation addressed in full Recovery Plans where necessary. This will be coordinated by the proposed Threatened Flora Recovery Teams for the Katanning and Narrogin Districts. All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Survey potential habitats for translocation  
Responsibility: NDTFRT, KDTFRT (both to be established), CALM (Katanning and Narrogin Districts, WATSCU)  
Cost: See Section 3.3.1 (Conduct further surveys)

**Table 2: Summary of recovery actions**

<b>Recovery Actions</b>	<b>Population</b>	<b>Priority</b>	<b>Responsibility</b>	<b>Completion date</b>
<b>Essential</b>				
Install DRF markers	1, 2c, 3, 4, 6, 7 & 8	High	CALM (Katanning, Narrogin, WATSCU)	Completed in March, 1996
Implement weed control	3, 7 & 8	High	CALM (SID, Katanning and Narrogin Districts, WATSCU)	1996, 97, 98
Develop a fire management plan	1-9	High	CALM (Katanning and Narrogin Districts), relevant authorities, land managers	1996, ongoing
Monitor populations	1-9	High	CALM (Katanning and Narrogin Districts, WATSCU)	1996, 97, 98
<b>Desirable</b>				
Conduct further surveys	–	Mod	CALM (Katanning and Narrogin Districts, WATSCU), Volunteers	1996, 97, 98
Information dissemination	1-9	Mod	CALM (Corporate Relations Division, Katanning and Narrogin Districts, WATSCU)	1996 ongoing
Preserve genetic diversity of the species	1-9	Mod	KDTFRT, NDTFRT (both to be established), CALM (TFSC, Katanning and Narrogin Districts), KPBG	Ongoing
Conduct research	1-9	Mod	CALM (SID, Katanning and Narrogin Districts, WATSCU)	1996, ongoing
Habitat rehabilitation	3, 7 & 8	Mod	CALM (Katanning and Narrogin Districts, WATSCU)	1996, 1997
Translocation		Low	NDTFRT, KDTFRT (both to be established), CALM (Katanning District and Narrogin Districts, WATSCU)	See 3.3.1

### 3.4 Costs

**Table 3: Summary of costs for each recovery action**

Recovery Action	1996			1997		1998	
	CALM	EA	KPBG	CALM	EA	CALM	EA
<b>Essential</b>							
Install DRF markers	900	300					
Implement weed control	750			750		750	
Develop a fire management plan	500			500		500	
Monitor populations	500			500		500	
<b>Sub-total</b>	<b>\$2150</b>	<b>\$300</b>		<b>\$1750</b>		<b>\$1750</b>	
<b>Desirable</b>							
Conduct further surveys	1100			650		650	
Information dissemination		500			1500		
Preserve genetic diversity of the species		500	1100				
Conduct research	1000			2000			
Habitat rehabilitation	1500						
<b>Sub-total</b>	<b>\$3600</b>	<b>\$1000</b>	<b>\$1100</b>	<b>\$2650</b>	<b>\$1500</b>	<b>\$650</b>	
<b>Total</b>	<b>\$5750</b>	<b>\$1300</b>	<b>\$1100</b>	<b>\$4400</b>	<b>\$1500</b>	<b>\$2400</b>	

EA Environment Australia (formerly ANCA)

**Total of all Costs: \$16 450**

#### ACKNOWLEDGMENTS

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Dr. R.J. Chinnock: The Botanic Gardens of Adelaide and State Herbarium  
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Interim Recovery Plan No. 14

**Appendix One:** Taxonomic description

A full taxonomic description of *Eremophila veneta* ms will be provided by Dr. R.J. Chinnock in Magnum Opus late in 1997. The following is a draft.

**Appendix Two:** Associated species

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CYPERACEAE	MIMOSACEAE	MYRTACEAE
<i>Lepidosperma pruinatum</i>	<i>Acacia hemiteles</i>	<i>Eucalyptus annulata</i>
	<i>Acacia lanuginophylla</i> (DRF)	<i>Eucalyptus gracilis</i>
PHORMIACEAE	<i>Acacia merrallii</i>	<i>Eucalyptus latens</i>
<i>Dianella revoluta</i>	<i>Acacia orbifolia</i>	<i>Eucalyptus longicornis</i>
	<i>Acacia ? xiophylla</i>	<i>Eucalyptus salmonophloia</i>
CASUARINACEAE		<i>Eucalyptus salubris</i>
<i>Allocasuarina acutivalvis</i>	PAPILIONACEAE	<i>Melaleuca adnata</i>
	<i>Daviesia spiralis</i>	<i>Melaleuca depauperata</i>
PROTEACEAE		<i>Melaleuca lateriflora</i> subsp.
<i>Dryandra</i> aff. <i>proteoides</i>	AIZOACEAE	<i>lateriflora</i>
<i>Grevillea huegelii</i>	<i>Carpobrotus</i> sp.	<i>Melaleuca radula</i>
<i>Hakea preissii</i>		<i>Melaleuca ? spicigera</i>
	SANTALACEAE	<i>Melaleuca thyoides</i>
CHENOPODIACEAE	<i>Exocarpus aphyllus</i>	<i>Melaleuca uncinata</i>
<i>Atriplex</i> sp.	<i>Santalum acuminatum</i>	<i>Melaleuca viminea</i>
<i>Enchylaena tomentosa</i>		
<i>Halosarcia indica</i> subsp. <i>bidens</i>	ASTERACEAE	MYOPORACEAE
<i>Halosarcia lepidosperma</i>	<i>Olearia dampieri</i> subsp. <i>eremicola</i>	<i>Eremophila decipiens</i>
<i>Maireana brevifolia</i>	<i>Olearia muelleri</i>	<i>Eremophila serpens</i>
<i>Rhagodia drummondii</i>		
<i>Rhagodia preissii</i>	SOLANACEAE	
	<i>Lycium australe</i>	

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DRF - Declared Rare Flora