INTERIM RECOVERY PLAN NO. 137

VARNISH BUSH

(*EREMOPHILA VISCIDA*)

INTERIM RECOVERY PLAN

2003-2008

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Photograph: A. Brown

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DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (the Department) Policy Statements Nos. 44 and 50.

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.

The Department 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This Interim Recovery Plan will operate from April 2003 to March 2008 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Critically Endangered, this IRP will be reviewed after five years and the need for a full Recovery Plan will be assessed.

This IRP was approved by the Director of Nature Conservation on 11 July, 2003. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting the Department, as well as the need to address other priorities.

Information in this IRP was accurate at April 2003.

SUMMARY

Scientific Name:	*Eremophila viscida*	**Common Name:**	Varnish Bush
Family:	Myoporaceae	**Flowering Period:**	September to October; and in February
DCLM Regions:	Wheatbelt, Midwest	**DCLM Districts:**	Merredin, Geraldton
Shires:	Mukinbudin, Westonia, Mullewa, Dalwallinu	**Recovery Teams:**	Merredin District Threatened Flora Recovery Team; Geraldton District Threatened Flora Recovery Team

Illustrations and/or further information: Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998) *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia; Richmond, G. and Coates, D. (1995) Population dynamics, seed biology and conservation of six endangered *Eremophila* species. Unpublished report, Australian Nature Conservation Agency, Department of Conservation and Land Management; Western Australian Herbarium (1998) FloraBase - Information on the Western Australian Flora. Department of Conservation and Land Management, Western Australia. http://www.calm.wa.gov.au/science/.

Current status: *Eremophila viscida* was declared as Rare Flora in October 1996 and ranked as Critically Endangered (CR) under the Western Australian *Wildlife Conservation Act 1950* in February 1997. At that time it met World Conservation Union (IUCN 2000) Red List Category 'CR' under criteria A1c+A2c;C1;D but, following the discovery of new populations, it now (2003) meets EN under IUCN criteria A4c;C1 as it occurs over a wide geographical area between Merredin and Mullewa with 16 populations and 816 mature plants currently known. If current circumstances do not change a gradual reduction in plant numbers is likely due to senescence, resulting in a slow decline in area of occupancy and extent of occurrence. However, the species is a disturbance opportunist and recruitment is likely to occur during that time. The main threats are poor recruitment due to inadequate disturbance, weeds, salinity and waterlogging, silting, erosion, inappropriate fire regimes, maintenance activities for roads, tracks, powerlines and firebreaks, grazing and disturbance by stock and feral animals, and chemical drift..

Critical habitat: The critical habitat for *Eremophila viscida* comprises the area of occupancy of the known population; similar habitat within 200 metres of the known population; remnant vegetation that links subpopulations; and additional nearby occurrences of similar habitat that do not currently contain the species but may have done so in the past and may be suitable for translocations.

Habitat critical to the survival of the species, and important populations: Given that this species is listed as Critically Endangered it is considered that all known habitat for wild and translocated populations is habitat critical.

Benefits to other species/ecological communities: There are no known threatened ecological communities that occur in the habitat of *Eremophila viscida*. However, several other threatened plant taxa (*Eremophila virens* and *Caladenia drakeoides*) will benefit from recovery actions put in place for the species. These actions will also improve the condition of associated bushland in general.

International Obligations: This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. However, as Eremophila viscida is not listed under any international agreement, the implementation of other international environmental responsibilities is not affected by this plan.

Role and interests of indigenous people: There are no known indigenous communities interested or involved in the management of areas affected by this plan. Therefore no role has been identified for indigenous communities in the recovery of this species.

Social and economic impacts: The implementation of this recovery plan has the potential to have some minimal social and economic impact as some populations are located on private property.

Evaluation of the Plans Performance: The Department of Conservation and Land Management, in conjunction with relevant Recovery Teams, will evaluate the performance of this IRP. In addition to annual reporting on progress of listed actions and comparison against the criteria for success and failure, the plan is to be reviewed within five years of its implementation.

Habitat requirements: *Eremophila viscida* is endemic to Western Australia where it is found in remnant vegetation over a wide area of largely cleared land between Latham and Pindar. Its preferred habitat appears to be areas of brown, sandy loam or red brown clay loam soils, in open woodland in association with *Eucalyptus loxophleba* and scrub vegetation (Mollemans *et al*. 1993) often near areas of exposed granite or alongside saline lake systems.

Existing Recovery Actions: The following recovery actions have been or are currently being implemented –

1. Relevant land managers have been notified of the location and threatened status of the species.
2. Declared Rare Flora (DRF) markers have been installed at Populations 3, 6, 10 and 16, and Subpopulations 7a, 11a, 12a and 15a.

3. Dashboard stickers and posters describing the significance of DRF markers have been produced and distributed.
4. As at December 2000 seed collections stored in the Department's Threatened Flora Seed Centre include 207 seeds from Population 6, 334 seeds from Subpopulation 7a, 45 seeds from Subpopulation 11a, 330 seeds from Subpopulation 12a and 1261 seeds from Subpopulation 12b. These are stored at –18°C.
5. The Botanic Garden and Parks Authority currently have 19 plants of *Eremophila viscida* from nine clones, in their nursery and botanic gardens.
6. In June 2001 staff from the Department's Geraldton District with assistance from the Department's Bushrangers and the Landcare officer from Mullewa undertook disturbance trials at Population 15. These trials included raking, burning and smoking.
7. The Merredin and Geraldton Districts Threatened Flora Recovery Teams (MDTFRT, GDTFRT) are overseeing the implementation of this Interim Recovery Plan (IRP) and will include information on progress in their annual reports to the Department's Corporate Executive and funding bodies.
8. Staff from the Department's Merredin and Geraldton Districts regularly monitor all populations of this species.

IRP Objective : The objective of this Interim Recovery Plan is to abate identified threats and maintain or enhance *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery criteria

Criteria for success: The number of individuals within populations and/or the number of populations have increased by ten percent or more.

Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by ten percent or more.

Recovery actions

1. Coordinate recovery actions.
2. Stimulate the germination of soil-stored seed.
3. Conduct further surveys.
4. Install fencing.
5. Install Declared Rare Flora markers.
6. Rehabilitate habitat.
7. Undertake weed control.
8. Silt prevention
9. Develop and implement a fire management strategy.
10. Control rabbits.
11. Monitor populations.
12. Collect seed and cutting material.
13. Seek improved security for populations.
14. Promote awareness.
15. Obtain biological and ecological information.
16. Propagate plants for translocation.
17. Undertake and monitor translocation.
18. Review the need for a full Recovery Plan and prepare if necessary.

1. BACKGROUND

History

The first known collection of *Eremophila viscida* was made from the Kununoppin area by F. E. Victor in 1916. Subsequently, collections have been made over a very large geographical range between Latham, Koorda, Carnamah, Ballidu (Merredin District) and Pindar (Geraldton District). Unfortunately, many of these collections have vague location details making surveys difficult.

In 1985, a report titled 'The vegetation, flora and avifauna of Chiddarcooping Nature Reserve" by A.S. Weston identified a new population of four plants in Chiddarcooping Nature Reserve. In 1993, as a result of research being undertaken by the Department's Science Division on six rare species of *Eremophila*, G. Richmond discovered a new population of *E. viscida* consisting of around 1000 plants on private property (Richmond and Coates 1995). The correct identification of plants in this population were subsequently confused with another Declared Rare *Eremophila* species *E. virens* which has similarly large waxy, green leaves and occurs at the same location. As a consequence, the area was not revisited until 2000.

Numerous surveys undertaken by staff from the Department's Nature Conservation Division, and Geraldton and Merredin Districts have resulted in the discovery of new populations near Pithara and south east of Mullewa. Currently, *Eremophila viscida* is known from 16 populations consisting of around 816 mature plants.

Description

Eremophila viscida is a large, erect shrub 2 to 6 m tall with sticky, shiny, brown, hairless branches and hairless to finely glandular-hairy leaves 5 to 10 cm long by 1 cm wide. The flowers are tubular, about 2 cm long, and are solitary or sometimes in twos. Each flower is on a 1 cm long stalk, which is enlarged beneath the flower. The calyx lobes are 7 mm long, greyish-blue or reddish in colour and are strongly veined. The corolla is white to pale yellow with purple spots. The stamens project beyond the floral tube. The ovary is hairy. Egg-shaped fruits are 5 to 7 mm long, 4 mm wide and are hairy on the upper part (Brown *et al.* 1998).

Eremophila viscida is distinguished from *Eremophila lucida* ms (Shining Poverty Bush) by its linear to lanceolate leaves, prominently spotted flowers and large greyish-blue or reddish calyx lobes (Brown *et al.* 1998).

Distribution and habitat

Eremophila viscida has a historical range of some 290 km between Latham, Koorda, Carnamah, Ballidu, Pindar and Merredin. It appears to prefer areas that are associated with granite and salt lake systems and plants are particularly frequent in runoff areas, including drainage lines or ephemeral creeks connected to granite outcrops. Preferred habitat is brown, sandy-loam or red brown clay-loam soils, in open woodland in association with *Eucalyptus loxophleba* and scrub vegetation (Mollemans *et al.* 1993).

Associated species include *Melaleuca lateriflora*, *Acacia acuminata*, *Scaevola spinescens*, *Eucalyptus longicornis*, *Allocasuarina* sp., *Acacia coolgardiensis* and *Eremophila serrulata*. *Eremophila viscida* also occasionally occurs with other threatened flora species including *Eremophila virens* and *Caladenia drakeoides.*

International Obligations

This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. However, as ***Eremophila viscida*** is not listed under any international agreement, the implementation of other international environmental responsibilities is not affected by this plan.

Role and interests of indigenous people

There are no known indigenous communities interested or involved in the management of areas affected by this plan. Therefore no role has been identified for indigenous communities in the recovery of this species.

Habitat critical to the survival of the species, and important populations

Given that this species is listed as Critically Endangered it is considered that all known habitat is habitat critical. In addition all populations, including any translocated populations, are considered important to the survival of the species. Recovery actions include survey for further populations that would lead to the identification of additional habitat critical.

Benefits to other species/ecological communities

There are no known threatened ecological communities that occur in the habitat of *Eremophila viscida* However, several populations other threatened plant taxa (*Eremophila virens* and *Caladenia drakeoides*) will benefit from recovery actions put in place for the species. Recovery actions will also improve the condition of associated bushland in general.

Social and economic impacts

The implementation of this recovery plan has the potential to have some minimal social and economic impact, as several populations are located on private property. However, most landholders are amenable to managing the habitat of the species for conservation. Recovery actions refer to continued liaison between stakeholders with regard this. Future actions that could minimise potential impact may include fencing, land acquisition, covenants and management agreements.

Evaluation of the Plan's Performance

The Department of Conservation and Land Management, in conjunction with the Merredin and Geraldton District Threatened Flora Recovery Teams will evaluate the performance of this recovery plan. In addition to annual reporting on progress against the criteria for success and failure, the plan is to be reviewed within five years of its implementation. Any changes to management / recovery actions made in response to monitoring results will be documented accordingly.

Critical habitat

Critical habitat is habitat identified as being critical to the survival of a listed threatened species or listed threatened ecological community. Habitat is defined as the biophysical medium or media occupied (continuously, periodically or occasionally) by an organism or group of organisms or once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind have the potential to be reintroduced (*Environment Protection and Biodiversity Conservation Act 1999*).

The critical habitat for *Eremophila viscida* comprises:

- the area of occupancy of known populations;
- areas of similar habitat within 200 metres of known populations (brown, sandy loam or red brown clay loam soils, in open woodland in association with *Eucalyptus loxophleba* and scrub vegetation) that provide potential habitat for natural recruitement);
- remnant vegetation that surrounds and links populations (this is necessary to allow pollinators to move between populations);
- additional occurrences of similar habitat that do not currently contain the species but may have done so in the past (these represent possible translocation sites); and
- the local catchment for the surface and ground waters that provide the ephemeral creekline habitat of the species (the species occurs in areas that are seasonally inundated and depend on the local hydrology).

Habitat critical to the survival of the species, and important populations

Given that this species is Critically Endangered it is considered that all known habitat is habitat critical. In addition all populations, including translocated populations, are considered important to the survival of the species.

Biology and ecology

Endemic to Australia where it is represented in all mainland states, *Eremophila* comprises some two hundred named and many unnamed species. While most occur in semi-arid and arid inland regions, they are extremely widespread over a wide geographic range, with some species found in the Western Australian Wheatbelt and others along the coast near Perth. Species in this genus are commonly known as emu bushes or poverty bushes.

A study on the storage ability of seed from 12 species of *Eremophila* in optimal conditions of low moisture content and low temperatures found *E. viscida* often exhibited better germination after one year in storage (50 to 100% germination) compared to fresh seed (87% germination). Therefore *Eremophila* seed has the potential for storage without loss of viability (Cochrane *et al.* 2002).

A visual assessment of the relative density of the starch grains within the root systems of *Eremophila viscida* show that it possesses characteristics of a resprouter. This has been confirmed by field observations, where suckering from disturbed root systems was evident. Due to the resinous nature of the leaves and stems, it is likely that *E. viscida* is highly flammable (Richmond and Coates 1995).

Eremophila viscida is a fast growing, widely distributed species. Although not common in cultivation, the species has great potential for use in semi-arid areas as a low windbreak and screening plant (Elliot and Jones 1984).

Threats

Eremophila viscida was declared as Rare Flora in October 1996 and ranked as Critically Endangered (CR) in February 1997. At that time it met World Conservation Union (IUCN 2000) Red List Category 'CR' under criteria A1c+A2c; C1; D but, following the discovery of new populations, it now (2003) meets EN under IUCN criteria A4c; C1 as it occurs over a wide geographical area between Merredin and Mullewa with 16 populations and 816 mature plants currently known. If current circumstances do not change a gradual reduction in plant numbers is likely due to senescence, resulting in a slow decline in area of occupancy and extent of occurrence. However, the species is a disturbance opportunist and recruitment is likely to occur during that time.

The main threats are poor recruitment, weeds, rising salinity and waterlogging, silting, erosion, inappropriate fire regimes, road, track and firebreak maintenance, grazing and trampling by stock, chemical drift and powerline maintenance.

- **Poor recruitement**, due to lack of appropriate disturbance, threatens most populations as, with the exception of Population 16 which are all young plants, very few juvenile plants of *Eremophila viscida* have been observed. Most of the other threats listed below are also likely to affect recruitment adversely.
- **Weed invasion** is a threat to most populations which occur in degraded habitat. Weeds suppress early plant growth by competing for soil moisture, nutrients and light. They also exacerbate grazing pressure and increase the fire hazard due to the easy ignition of high fuel loads, which are produced annually by many weed species.
- **Rising salinity and waterlogging** resulting from agricultural clearing are impacting on Subpopulations 12b, 12c, 15a and 15b, and Populations 13 and 14. These threats are leading to degradation of the species' habitat and, if not addressed, will become worse in the medium to long term.
- **Silting** of an ephemeral creekline is evident at Subpopulation 14c and is likely to be a threat to other populations that occur along watercourses. Silting may result in changes to water flow and water levels thereby altering the local hydrology on which *Eremophila viscida* is dependent.
- **Soil erosion** is damaging the habitat of Subpopulations 12b and 12c. Land clearing has resulted in large volumes of water channeling down a creekline and eroding soil along its banks. Sheep moving through the area further exacerbate the problem by loosening soil with their hooves.

- **Inappropriate fire regimes** may affect the long term viability of populations. It is thought that occasional fire or other disturbance is necessary for recruitment, however, frequent fire that occurs before regenerating or juvenile plants have reached maturity and have replenished the soil seed bank is likely to result in the loss of populations. Regeneration has been observed at Population 16 following a fire in 1998, and at Subpopulation 14c which was burnt a number of years ago (personal communication K. Brunt[1]).
- **Road, track and firebreak maintenance** threaten most populations. Threats include grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Some of these actions also encourage weed invasion.
- **Grazing and stock disturbance** (sheep and cattle) is a threat to Subpopulations 12b, 12c and 14b and 14c and a lesser threat to other private property populations. Plants at Population 14 have been subject to intense grazing pressure in the past and on many plants have left foliage only on upper branchlets. Increased nutrient levels from sheep and cattle droppings has resulted in the proliferation of weeds and trampling of vegetation is also impacting on the habitat of the species. Grazing may also have an impact on the establishment of *Eremophila viscida* seedlings thus limiting the natural recruitment of the species.
- **Grazing and trampling by feral animals** such as rabbits (*Oryctolagus cuniculus*) have impacted on plants at Population 6 with stems bitten off and leaves chewed on one young plant. Rabbits are present at most populations and are damaging habitat during warren construction. Although it appears that larger *Eremophila viscida* plants are not grazed by goats they are impacting on the plant and its habitat at Population 16 by digging, trampling and breaking foliage when moving through the area. Increased nutrient levels in the soil from both rabbit and goat droppings is also likely and may result in increased weed invasion. Grazing would have an impact on the establishment of young plants of *Eremophila viscida* thereby limiting natural recruitment.
- **Chemical drift** from herbicide and fertiliser applications during work on adjacent farmland may affect the species' long term survival.
- **Powerline maintenance** is a potential threat to Subpopulation 11b. Disturbance during maintenance may encourage weed invasion and also directly damage plants. The relevant authority has been made aware of the population.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1. NNE of Warralakin	Nature Reserve	1985 4		Poor regeneration, weeds, inappropriate fire regimes
2A. NE of Warrachuppin	Private Property	1990 1	Disturbed	Poor regeneration, weeds, inappropriate fire regimes, stock disturbance.
2B. NE of Warrachuppin	Shire Road Reserve	1986 1 2001 3	Poor	Poor regeneration, weeds, road maintenance, inappropriate fire regimes.
3.SW of Mukinbudin	Shire Road Reserve	1984 1 2000 2	Disturbed but plants healthy	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
4. S of Warrachuppin	Shire Road Reserve	1980 5 2000 0	Poor	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
5. NW of Warralakin	Shire Road Reserve	1991 1 2000 0	Poor	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
6. NE of Mukinbudin	Shire Road Reserve	1992 5 2000 4 (1)	Moderate	Poor regeneration, road maintenance, weeds, grazing, inappropriate fire regimes.
7A. N of Warralakin	Shire Road Reserve	1991 27 (1) [2 dead] 2000 6 [4 dead]	Moderate/ Poor	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
7B. N of Warralakin	Private Property	1991 2 2000 1	Moderate	Poor regeneration, chemical drift, weeds, firebreak maintenance, inappropriate fire regimes.
8. SSE of Mount Grey	Private Property	1992 1 2000 0	Disturbed	Poor regeneration, stock disturbance, weeds, inappropriate fire regimes.
9. SE of Mount Grey	Private Property	1992 1 2000 0	Disturbed	Poor regeneration, stock disturbance, weeds, inappropriate fire regimes.
10. S of Warrachuppin	Shire Road Reserve	1980 4 2000 5	Disturbed	Poor regeneration, road maintenance, weeds, chemical drift, inappropriate fire regimes.

[1] Kate Brunt, Conservation Officer, the Department's Merredin District

11A. Warrachuppin	Shire Road Reserve	1980 1 2000 2	Disturbed	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
11B. Warrachuppin	Private property	1993 2 2000 2	Disturbed	Poor regeneration, road maintenance, weeds, powerline maintenance, chemical drift, inappropriate fire regimes.
12A. NW of Warralakin	Shire Road Reserve	2000 2 [1 dead]	Moderate	Poor regeneration, road maintenance, weeds, inappropriate fire regimes.
12B. NW of Warralakin	Private Property	1993 450 2000 400 [30 dead]	Moderate/ Poor	Poor regeneration, stock disturbance, salinity, erosion, chemical drift, weeds, firebreak maintenance, inappropriate fire regimes.
12C. NW of Warralakin	Private Property	1993 1000 2001 229 (4) [15 dead]	Moderate/ Poor	Poor regeneration, stock disturbance, salinity, erosion, chemical drift, weeds, firebreak maintenance, inappropriate fire regimes.
13. NW Pindar	Pastoral Lease	1997 2 2001 (1)	Poor	Poor regeneration, salinity, weeds, inappropriate fire regimes.
14A. SE of Pithara	Private Property	2000 1 2001 1	Poor	Poor regeneration, salinity, weeds, inappropriate fire regimes.
14B. SE of Pithara	Private Property	2001 2	Poor	Poor regeneration, grazing, weeds, salinity, inappropriate fire regimes, chemical drift, firebreak maintenance, stock disturbance.
14C. SE of Pithara	Private Property	2001 50+	Poor	Poor regeneration, grazing, weeds, salinity, inappropriate fire regimes, chemical drift, stock disturbance, silting.
15A. SE of Mullewa	Shire Road Reserve	2001 4 [1 dead] 2003 2 [3 dead]	Moderate	Poor regeneration, road maintenance, salinity, inappropriate fire regimes.
15B. SE of Mullewa	Private Property	2001 19 [20 dead]	Poor	Poor regeneration, salinity, inappropriate fire regimes, grazing.
16A. SE of Mullewa	Conservation Park (Leased by the Dept)	2001 *80 [1 dead]	Healthy	Firebreak maintenance, inappropriate fire regimes, grazing.
16B. SE of Mullewa	Unallocated Crown Land	2001 *see above [1 dead]	Healthy	Firebreak maintenance, inappropriate fire regimes, grazing.

Numbers in brackets = number of seedlings. * = total for subpopulations combined.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of the population or within the defined critical habitat of *Eremophila viscida* require assessment. No developments should be approved unless the proponents can demonstrate that they will not have a deleterious impact on the species, or its habitat or potential habitat, or the local surface and ground water hydrology.

2. RECOVERY OBJECTIVE AND CRITERIA

Objectives

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

Criteria for success: The number of individuals within populations and/or the number of populations have increased by ten percent or more.
Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by ten percent or more.

3. RECOVERY ACTIONS

Existing recovery actions

All land managers have been notified of the location and threatened status of the species. The notification details the Declared Rare status of *Eremophila viscida* and the legal responsibility to protect it.

Declared Rare Flora (DRF) markers have been installed at Populations 3, 6, 10 and 16, and Subpopulations 7a, 11a, 12a and 15a. These serve to alert people working in the vicinity to the presence of DRF, and the need to avoid work that may damage plants or their habitat. Dashboard stickers and posters describing the significance of DRF markers have been produced and distributed.

Approximately 330 seeds were collected from Subpopulation 12a in January 1994 and stored in the Department's TFSC at –18°C. The TFSC test the viability of the seed initially and after one year in storage. The initial germination rate of *Eremophila viscida* seed was found to be 87% and after one year in storage was 90%. A collection of 289 fruits (each containing several seeds) was made in January 1994 from Subpopulation 7a. Seed from these had an initial germination rate of 64%. Further collections of 334 seeds from Subpopulation 7a, and 45 seeds from Subpopulation 11a were made in January 1999 and had an initial germination rate of 92% and 75% resepectively. In December 2000, 1261 seeds were collected from Subpopulation 12b and 207 seeds from Population 6 and these had an initial germination rate of 94% and 100% respectively (unpublished data, A. Cochrane[2]).

The BGPA currently have 19 plants of *Eremophila viscida* in their nursery and gardens. These originated from cuttings taken from nine wild plants. Propagation of the species is difficult with a 20% strike rate from most cuttings and grafts. Two germinants from seed collected by the TFSC were received in 1999 but both died (personal communication A. Shade[3]).

Disturbance trials to stimulate seed germination were undertaken at Population 15 in June 2001 by staff from the Department's Geraldton District with assistance from the Department's Bushrangers and the Landcare officer from Mullewa. Trials included raking, burning and smoke treatment. The trials are being monitored and to date no seedlings have appeared (personal communication A. Chant[4]).

The Merredin and Geraldton District Threatened Flora Recovery Teams (MDTFRT, GDTFRT) are overseeing the implementation of this IRP and will include information on progress in their annual report to the Department's Corporate Executive and funding bodies.

Staff from the Department's Merredin and Geraldton Districts regularly monitor all populations of this species.

Future recovery actions

Where populations occur on lands other than those managed by the Department, permission has been or will be sought from appropriate land managers prior to recovery actions being undertaken.

1. Coordinate recovery actions

The Merredin and Geraldton District Threatened Flora Recovery Teams (MDTFRT, GDTFRT) are coordinating recovery actions for *Eremophila viscida* and will include information on progress in their annual report to the Department's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $1,000 per year.

2. Stimulate the germination of soil-stored seed

Burning, use of smokewater and soil disturbance may be effective in stimulating the germination of soil-stored seed. These trials will be conducted near existing populations in areas cleared of weeds, and/or in areas where

[2] Anne Cochrane, Manager, the Department's Threatened Flora Seed Centre
[3] Amanda Shade, Horticulturalist, Botanic Garden and Parks Authority
[4] Alanna Chant, Previous Conservation Officer, the Department's Geraldton District

Eremophila viscida was known to occur previously but is no longer present above ground. If germination occurs monitoring will record the time of first flowering and seed production and the age of plants when they senesce. This will enable the optimal interval time between disturbances to be estimated.

Action: Stimulate the germination of soil-stored seed
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $4,900 in second, third and fourth years.

3. Conduct further surveys

Historically, populations of *Eremophila viscida* have been found over an extremely wide geographical range and it is highly likely that there are more extant populations than are currently known. Further surveys will be conducted during its flowering period (mainly September to October). Areas considered suitable for possible translocation will also be noted. Volunteers from the local community, Wildflower Societies and Naturalist Clubs will be encouraged to be involved in surveys supervised by Departmental staff.

Action: Conduct further surveys
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $5,700 per year.

4. Install fencing

To prevent possible stock damage, a fence will be erected around subpopulations 12b, 12c, 14b, 14c, 15b, 16a and 16b. Fencing will include a buffer of surrounding habitat. Funding will be sought from various sources.

Action: Install fencing
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $20,900 in first year.

5. Install Declared Rare Flora markers

Declared Rare Flora (DRF) markers are required for Subpopulation 2b which is on a road reserve.

Action: Install DRF markers
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $700 in first year.

6. Rehabilitate habitat

Restoration of *Eremophila viscida* habitat through the re-introduction of endemic plant species will be conducted for populations 12b, 12c, 13, 14c and 15b.

Action: Rehabilitate habitat
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $4,100 in first, second and third years.

7. Undertake weed control

Weed control including hand weeding and localised application of herbicide will be undertaken in consultation with land managers. All weed control will be followed by a report on the method, timing and the success or otherwise of the treatment, and any effect on *Eremophila viscida* and its associated native plant species. It is anticipated that a number of native species will regenerate after weed competition is removed.

Action: Undertake weed control
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $1,800 per year.

8. Silt prevention

Prevention of further silting at Subpopulation 14c and other populations where deemed necessary will be developed and implemented in liaison with relevant land managers and Agriculture Western Australia. This may include mechanical removal of silt that has built up in creeklines.

Action: Silt prevention
Responsibility: The Department (Merredin and Geraldton Districts; Agriculture WA) through the MDTFRT and GDTFRT
Cost: To be determined

9. Develop and implement a fire management strategy

The response of *Eremophila viscida* and its habitat to fire has not been documented, although it is thought that occasional fire is necessary for recruitment. Until its affect is better understood, fire will if possible be prevented from occurring in the area of populations, except where it is being used experimentally or as a recovery tool. A fire management strategy will be developed to determine fire control measures and fire frequency.

Action: Develop and implement a fire management strategy
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $4,200 in first year and $2,000 in subsequent years.

10. Control rabbits

There is evidence of some rabbit grazing in Population 6 and any young shoots are likely to be extremely vulnerable. In addition, habitat is being damaged by rabbit warren construction and this, combined with the increased nutrient levels and the presence of weed seed in their droppings, is introducing weeds into the habitat. Baiting will be undertaken in and around this area.

Action: Control rabbits
Responsibility: The Department (Merredin District) through the MDTFRT
Cost: $600 in first, second and third years.

11. Monitor populations

Annual monitoring of further habitat degradation (including weed invasion and plant diseases), population stability (expansion or decline), pollination activity, seed production, recruitment, longevity and predation is essential. All populations will be inspected annually with special attention given to impacts from rising salinity.

Action: Monitor populations
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $2,200 per year.

12. Collect seed and cutting material

Preservation of germplasm is essential to guard against the possible extinction of wild populations with seed and cuttings used to propagate plants for future translocations. Seed is required from all populations to maximise the genetic diversity of *ex situ* material. Cuttings will be obtained to establish a living collection at the Botanic Garden and Parks Authority (BGPA).

Action: Collect seed and cutting material
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $5,200 in first year and $3,800 per year thereafter.

13. Seek improved security for populations

Staff from the Department's Merredin and Geraldton Districts are liaising with land managers and landowners to ensure that populations are not accidentally damaged or destroyed. In addition, ways and means of improving the security of populations and their habitat will be investigated. For populations that occur on private property (Subpopulations 12b, 12c, 14b and 14c), this may include land purchase, conservation covenants or using the Land for Wildlife scheme.

Action: Seek improved security for populations
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $500 per year for liaison; cost of purchasing to be determined.

14. Promote awareness

The importance of biodiversity conservation and the need for the long-term protection of wild populations of this species will be promoted to the community through poster displays and the local print and electronic media. Formal links with local naturalist groups and interested individuals will also be encouraged. An information sheet, which includes a description of the plant, its habitat, threats, recovery actions and photos has been produced and distributed.

A reply paid postal drop illustrating *Eremophila viscida* and describing its distinctive features and habitat will be produced and distributed to residents in Shires that contain possible habitat of the species. Postal drops aim to stimulate interest, provide information about threatened species and provide a name and number to contact if new populations are located by members of the community.

Action: Promote awareness
Responsibility: The Department (Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $2,800 in first year and $1,400 in second year and $1,100 in remaining years.

15. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Eremophila viscida* will provide a better scientific basis for management of the wild populations. An understanding of the following is particularly necessary for effective management:

1. Soil seed bank dynamics and the role of various disturbances (including fire), competition, rainfall and grazing in germination and recruitment.
2. The pollination biology of the species, and the requirements of pollinators.
3. The reproductive strategies, phenology and seasonal growth of the species.
4. The population genetic structure, levels of genetic diversity and minimum viable population size.
5. The impact of salinity on *Eremophila viscida* and its habitat.

Action: Obtain biological and ecological information
Responsibility: The Department (Science Division, Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $20,800 per year for the first three years.

16. Propagate plants for translocation

The propagation of plants in readiness for translocation is essential as nearly all known wild populations of *Eremophila viscida* are under threat. Seed and/or cuttings will need to be taken and propagated at the BGPA for planting the following year.

Action: Propagate plants for translocation
Responsibility: The Department (Merredin and Geraldton Districts) and the BGPA through the MDTFRT and GDTFRT
Cost: $2,100 in first and second years.

17. Undertake and monitor translocation

Although translocations are generally undertaken under full Recovery Plans, the many threats to wild populations of this species require the development of a translocation proposal within the 5 year time frame of this IRP. The translocation will be coordinated by the MDTFRT and GDTFRT recovery teams. Information on the translocation of threatened animals and plants in the wild is provided in the Department's Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. All translocation proposals require endorsement by the Director of Nature Conservation.

Monitoring of the translocation is essential and will be undertaken according to the timetable which will be developed for the Translocation Proposal.

Action: Undertake and monitor translocation
Responsibility: The Department (Science Division, Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $13,800 in second year, $7,300 in third and $4,500 in remaining years.

18. Review the need for a full Recovery Plan and prepare if necessary

At the end of the fourth year of the five-year term of this Interim Recovery Plan, if the taxon is still ranked as Critically Endangered, the need for a full Recovery Plan or a review of this IRP will be assessed and a plan prepared if necessary.

Action: Review the need for a full Recovery Plan and prepare if necessary
Responsibility: The Department (WATSCU, Merredin and Geraldton Districts) through the MDTFRT and GDTFRT
Cost: $15,700 in the fifth year (if required).

4. TERM OF PLAN

This Interim Recovery Plan will operate from April 2003 to March 2008 but will remain in force until withdrawn or replaced. If the taxon is still ranked Critically Endangered after five years, the need to review this IRP or to replace it with a full Recovery Plan will be determined.

5. ACKNOWLEDGMENTS

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Kate Brunt	Conservation Officer, DCLM's Merredin District
Alanna Chant	Conservation Officer, DCLM's Geraldton District
Bob Chinnock	Botanist, South Australian Herbarium
Anne Cochrane	Manager, DCLM's Threatened Flora Seed Centre
Anthony Desmond	Regional Leader, Nature Conservation, DCLM's Midwest Region
Mike Fitzgerald	Former Project Officer, DCLM's Merredin District
Sue Patrick	Senior Research Scientist, DCLM's Science Division
Amanda Shade	Horticulturalist, Botanic Garden and Parks Authority

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7. TAXONOMIC DESCRIPTION

Elliot, W. R. and Jones, D.L. (1984) *Encyclopaedia of Australian Plants Suitable for Cultivation, Vol 3*. Lothian Publishing Co., Melbourne.

Eremophila viscida

Medium to tall shrub; branches glabrous, sticky, shiny brown; leaves 5-10 cm long by about 1 cm wide, alternate, lanceolate to elliptic, folded lengthwise, shiny, sticky, glabrous, margins entire, apex pointed; flowers tubular, about 2 cm long, white to pale yellow or reddish, with purple-spotted interior, exterior hairy, on slender pedicels, in upper axils; stamens exserted; calyx lobes to about 0.7 cm long, grey-blue or reddish, blunt, veined; fruit ovoid, 0.5 – 0.7 cm x about 0.4 cm, compressed, hairy on the upper part.

Australian Government

Department of the Environment and Heritage

ADDENDUM

Varnish Bush (*Eremophila viscida*) Interim Recovery Plan 2003-2008

In adopting this plan under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Minister for the Environment and Heritage has approved the following modifications.

Critical Habitat

The plan identifies a broad area as critical habitat, including buffer zones of a set distance around known populations. The Threatened Species Scientific Committee does not necessarily believe that such an area qualifies as habitat critical to the survival of the species, as defined in the EPBC Act.

Recovery Criteria

For the purposes of reviewing this recovery plan under the EPBC Act, the Recovery Criteria are amended to read as follows:

Criteria for success: The number of individuals within populations and/or the number of populations have increased by 10% or more over the period of the plan's adoption under the EPBC Act.

Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by 10% or more over the period of the plan's adoption under the EPBC Act.