

INTERIM RECOVERY PLAN NO. 253

**SILKY FRANKENIA**  
**(*FRANKENIA CONFERTA*)**  
**INTERIM RECOVERY PLAN**  
**2008-2013**



April 2008

Department of Environment and Conservation  
Kensington

## 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. Note: the Department of CALM formally became the Department of Environment and Conservation (DEC) in July 2006. DEC will continue to adhere to these Policy Statements until they are revised and reissued.

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.

DEC is committed to ensuring that Threatened taxa are conserved through the preparation and implementation of Recovery Plans (RPs) or IRPs, and by ensuring that conservation action commences as soon as possible and, in the case of Critically Endangered (CR) taxa, always within one year of endorsement of that rank by the Minister.

This IRP will operate from April 2008 to March 2013 but will remain in force until withdrawn or replaced. It is intended that, if the species is still ranked Vulnerable, this IRP will be reviewed after four years and the need for a full Recovery Plan will be assessed.

This IRP was approved by the Director of Nature Conservation on 30 April 2008. The allocation of staff time and provision of funds identified in this IRP is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this IRP was accurate at April 2008.

This IRP was prepared with financial support from the Australian Government to be adopted as a National Recovery Plan under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

## IRP PREPARATION

This IRP was prepared by Robyn Luu<sup>1</sup> and Andrew Brown<sup>2</sup>.

<sup>1</sup>Project Officer, Species and Communities Branch, DEC, PO Box 51 Wanneroo, 6946.

<sup>2</sup>Threatened Flora Coordinator, Species and Communities Branch, DEC, PO Box 51 Wanneroo, 6946.

## ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this IRP:

Ben Bayliss	Former Project Officer, DEC's Species and Communities Branch
Gina Broun	Conservation Officer, DEC's Moora District
Kate Brunt	Former Conservation Officer, DEC's Yilgarn District
Alanna Chant	Conservation Officer, DEC's Geraldton District
Anne Cochrane	Senior Research Scientist, DEC's Science Division
Joel Collins	Conservation Officer, DEC's Avon Mortlock District
Andrew Crawford	Technical Officer, DEC's Science Division
Anne Harris	Former Project Officer, DEC's Species and Communities Branch
Wendy Johnston	Conservation Officer, DEC's Avon Mortlock District
David Jolliffe	District Nature Conservation Officer, DEC's Yilgarn District
Mike Lyons	Research Scientist, DEC's Science Division
Diana Papenfus	Former Project Officer, DEC's Species and Communities Branch
Craig Douglas	Project Officer, DEC's Species and Communities Branch

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and DEC's Species and Communities Branch for assistance.

**Cover photograph** by Diana Papenfus.

## CITATION

This IRP should be cited as:

Department of Environment and Conservation (2008). Silky frankenia (*Frankenia conferta*) Interim Recovery Plan 2008-2013. Interim Recovery Plan No. 253. Department of Environment and Conservation, Western Australia.

## SUMMARY

<b>Scientific Name:</b>	<i>Frankenia conferta</i> Diels	<b>Common Name:</b>	Silky Frankenia
<b>Family:</b>	Frankeniaceae	<b>Flowering Period:</b>	October
<b>DEC Regions:</b>	Wheatbelt, Midwest	<b>DEC Districts:</b>	Avon Mortlock, Geraldton, Moora
<b>Shires:</b>	Koorda, Dalwallinu, Perenjori, Coorow	<b>Recovery Teams:</b>	Avon Mortlock, Moora and Geraldton districts Threatened Flora Recovery Teams

**Illustrations and/or further information:** Atkins, K. (2008) *Declared Rare and Priority Flora List for Western Australia*, Department of Environment and Conservation, Western Australia; Barnsley, B. (1982) Frankeniaceae p112-146. *Flora of Australia Volume 8 Lecythidales to Batales*. Commonwealth of Australia, New South Wales; Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998) *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia; Western Australian Herbarium (2007) FloraBase - Information on the Western Australian Flora. Department of Conservation and Land Management, Western Australia. <http://www.calm.wa.gov.au/science/>.

**Current status:** *Frankenia conferta* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in August 2001 and currently meets World Conservation Union (IUCN 2001) Red List Category Vulnerable (VU) under criteria B1ab(iii)+2ab(iii) due to the limited area of occupancy and number of locations, and a continuing decline in the area, extent and/or quality of habitat. The main threat to the species is changes to hydrology from rising salinity and waterlogging. The species is listed as Extinct under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

**Description:** *Frankenia conferta* is a small shrub with the stems, leaves and calyx covered with short, soft hairs. The stalkless, linear leaves are clustered at the nodes of the stem. They are 2 to 5 mm long, 1 mm wide and their margins are recurved to cover the midrib. Each pair of leaves is united by a sheath, edged with fine hairs. Flowers are grouped in dense heads at the tops of the branches. The calyx is a pleated tube, 3.5 to 4.7 mm long. The flowers are 6 to 8mm long and have five petals, which are possibly pale pink. There are six stamens and the style branches into 3 linear segments. There are three placentas on the walls of the ovary, each with five to seven ovules attached. The seed is covered with small protuberances (Brown *et al.* 1998).

**Habitat requirements:** *Frankenia conferta* is widely distributed between Koorda, Dalwallinu, Perenjori and Coorow, growing in clayey soils on the edge of salt lakes.

**Habitat critical to the survival of the species, and important populations:** Habitat critical to the survival of the species includes the area of occupancy of important populations; areas of similar habitat surrounding important populations (i.e. among other halophytic shrubs on clay sands with gypsum or white-grey shallow sand over clay) provide potential habitat for natural range extension and are necessary to provide habitat for pollinators; the local catchment of the surface and possibly ground waters that maintain the habitat of the species; and additional occurrences of similar habitat that may contain the species or be suitable sites for future translocations.

For most species listed as Vulnerable some populations would be considered more important to the species' ongoing survival than others. These are generally the larger populations, those on conservation estate and those at the extremes of its range. However, on the basis of current knowledge it appears that all the populations of this species are important. This will need to be reappraised when further survey for possible new populations has been completed and also after the results of genetic studies are known.

**Benefits to other species/ecological communities:** There are no other known listed threatened species or ecological communities in the habitat of *Frankenia conferta*. However, recovery actions implemented to improve the quality or security of the habitat of populations of *F. conferta* are likely to also improve the status of habitat in which populations are located.

**International Obligations:** This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity that was ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. The species is not listed under the United Nations Environment Program World Conservation Monitoring Centre (UNEP-WCMC) Convention on International Trade in Endangered Species (CITES). In addition, it is not listed under any other specific international treaty and this Interim Recovery Plan (IRP) does not affect Australia's obligations under these international agreements.

**Indigenous Consultation:** Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council and the Department of Indigenous Affairs to assist in the identification of

cultural values for land occupied by *Frankenia conferta*, or groups with a cultural connection to land that is important for the species' conservation, and to determine whether there are any issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. Where no role is identified for the indigenous community associated with this species in the development of the recovery plan, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

**Social and economic impacts:** The implementation of this recovery plan is unlikely to cause significant adverse social or economic impacts. However, as one population (Population 8) is located on a Shire Reserve its protection may potentially affect Shire activities. In addition, exploration licences have been applied for in the areas containing populations 5 and 7 and subpopulations 6a and 6b. Actions will involve liaison and cooperation with all stakeholders with regard to these areas.

**Affected interests:** Stakeholders potentially affected by the implementation of this plan include the Shire of Koorda, as managers of the land that contains Population 8.

**Evaluation of the Plans Performance:** DEC will evaluate the performance of this IRP in conjunction with the Avon Mortlock, Moora and Geraldton districts Threatened Flora Recovery Teams. In addition to annual reporting on progress with listed actions and comparison against the criteria for success and failure, the plan is to be reviewed within five years of its implementation.

#### Completed recovery actions

1. Land managers have been notified of the location and threatened status of the species.
2. An article on the rediscovery of *Frankenia conferta* appeared in the March/April 2001 Newsletter of the former Department of Conservation and Land Management (CALM).
3. A survey of *Frankenia conferta* and a number of other rare wheatbelt species was undertaken in spring 2003 by Diana Papenfus. Five new populations of the species were located (Papenfus 2003).
4. Research into the population characteristics of *Frankenia conferta* was undertaken in 2003/2004 by staff from the former Department of CALM Species and Communities Branch (Harris 2004).

#### Ongoing and future recovery actions

1. Staff from DEC's Avon Mortlock, Moora and Geraldton Districts regularly monitor populations of this species.
2. The Avon Mortlock, Moora and Geraldton districts Threatened Flora Recovery Teams (MDTFRT, MDTFRT & GDTFRT) are overseeing the implementation of this IRP and will include information on progress in their annual reports to DEC's Corporate Executive and funding bodies.

**IRP Objective:** The objective of this IRP 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 populations have increased or individuals within populations have increased by ten percent or more over the five year term of this plan.

**Criteria for failure:** The number of populations have decreased or individuals within populations have decreased by ten percent or more over the five year term of this plan.

#### Recovery actions

1. Coordinate recovery actions
2. Map habitat
3. Conduct further surveys
4. Collect seed
5. Monitor populations
6. Monitor salinity and groundwater levels
7. Obtain biological and ecological information
8. Promote awareness
9. Achieve long-term protection of habitat
10. Liaise with relevant land managers
11. Review the IRP and assess the need for further recovery actions

## 1. BACKGROUND

### History

*Frankenia conferta* was first collected from the Avon District and at Cummening, east of York by Martha Heal in 1890. It was subsequently thought to have become extinct until rediscovered north-west of Ballidu during a survey conducted in 2000/2001 by M. Lyons<sup>1</sup> as part of a 'Botanical Survey of the Wheatbelt'.

In 2003, surveys were conducted by D. Papenfus<sup>2</sup> resulting in five new populations being discovered, one population near Marchagee north of Moora and the others in Koorda and Cowcowing. Currently the species is known from nine populations which together contain approximately 2000 plants.

### Description

*Frankenia conferta* is a small shrub; stems simple, with short, spreading or retrorse hairs. Leaves sessile, linear, 2-5mm long, clustered at nodes, puberulous; upper surface sometimes encrusted; margins recurved covering midrib; sheath ciliate, puberulous outside. Flowers in dense dichasia; bracts similar to leaves; bracteoles sessile and attached to sheath or shortly petiolate and free or adnate to inside of sheath. Calyx 3.5-4.7mm long, 1-1.5mm wide, puberulous. Petals 5, 6-8mm long. Stamens 6. Style 3-branched; stigmas linear. Ovules 5-7 on each of 3 parietal placentas. Seed papillose (Barnsley 1982).

*Frankenia conferta* differs from its relatives *F. brachyphylla* (short-leaved frankenia) and *F. decurrens* (decurent-leaved frankenia) in its dense head-like inflorescence, which is neither solitary nor greatly branched, and the shape of the leaf lamina which is free below the point of attachment and does not extend down the stem (Brown *et al.* 1998).

### Distribution and habitat

*Frankenia conferta* is widely distributed between Koorda, Dalwallinu, Perenjori and Coorow. However, sites are localised and sparsely scattered within lake chains and major drainage lines in the Yarra Yarra, Ninghan and Avon catchments. The species is located around the high water mark of lake shorelines to the tops of low berms within saline pans. Plants also occur on the floor of major drainage lines within localised swales where they are subject to seasonal inundation. The species grows among other halophytic shrubs on clay sands with gypsum or white-grey shallow sand over clay. Associated species include *Halosarcia* spp. and *Atriplex holocarpa* (Harris 2004).

### Summary of population land vesting, purpose and tenure

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1. NW of Ballidu	Avon Mortlock	Dalwallinu	Invested Reserve	Public Utility	DEC / DPI
2. SW of Koorda	Avon Mortlock	Koorda	Aboriginal Affairs Planning Authority	Use and benefit of Aboriginal inhabitants	Department of Indigenous Affairs
3. SW of Koorda	Avon Mortlock	Koorda	Department of Land Information	Sanitary site and common	DPI
4. N of Kalannie	Avon Mortlock	Dalwallinu	Department of Land Information	Un-allocated Crown Land	DEC / DPI
5. E of Kalannie	Avon Mortlock	Koorda	Department of Land Information	Un-allocated Crown Land	DEC / DPI
6A. E of Kalannie	Avon Mortlock	Koorda	Department of Land Information	Un-allocated Crown Land	DEC / DPI
6B. E of Kalannie	Avon Mortlock	Koorda	Department of Land Information	Un-allocated Crown Land	DEC / DPI

<sup>1</sup> Mike Lyons, Research Scientist, DEC Science Division

<sup>2</sup> Diana Papenfus, Previously Project Officer, former Department of CALM

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
<b>7. NW of Latham</b>	Geraldton	Perenjori	Department of Land Information	Un-allocated Crown Land	DEC / DPI
<b>8. W of Burakin</b>	Avon Mortlock	Koorda	Shire of Koorda	Recreation	Shire of Koorda
<b>9. Marchagee</b> (Nature Reserve)	Moora	Coorow	Conservation Commission of Western Australia	Conservation of Flora and Fauna	DEC

Populations in **bold text** are considered to be Important Populations; DPI = Department of Planning and Infrastructure, DEC = Department of Environment and Conservation

## Biology and ecology

In 2003/2004, staff from CALM's (now DEC) former Western Australian Threatened Species and Communities Unit (WATSCU) researched plant size and vigour, reproductive characteristics and soil characteristics and developed a framework for monitoring changes in five different locations of *Frankenia conferta* (Harris 2004). This study concluded the following:

- Smaller sized populations may have limited variability with a smaller gene pool, resulting in less tolerance to various stresses and threats;
- Regular monitoring using the framework established is necessary to verify that some populations may be in decline (populations 7 and 9 particularly);
- A high proportion of plants from lower size classes were also in low vigour classes;
- The high number of juveniles present in one population suggests that recruitment of plants may be associated with episodic events;
- The greater proportion of plants (78.6%) produced flowers but fruit set was low. Viable seed production was also low with a high proportion of empty and predated fruits;
- The pattern of recruitment by seed of juveniles in clumps around adult plants along residual stems suggest that seeds are held in fruits on the plant for at least one season and are not immediately dehisced until conditions for germination are favourable;
- *Frankenia conferta* recruits both sexually and vegetatively. Clonal reproduction dominates in four of the five populations by the proliferation of plants from adventitious roots;
- The production of adventitious roots is advantageous for survival through unfavourable seasons;
- Results of soil analysis varied between sites from 107mSm<sup>-1</sup> to 1770mSm<sup>-1</sup> (Harris 2004).

## Threats

*Frankenia conferta* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in August 2001 and currently meets World Conservation Union (IUCN 2001) Red List Category Vulnerable (VU) under criteria B1ab(iii)+2ab(iii) due to the limited are of occupancy and number of locations, and a continuing decline in the area, extent and/or quality of habitat. The main threat to the species is changes to hydrology from rising salinity and waterlogging. The species is listed as Extinct under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

- **Rising salinity and waterlogging** resulting from broad scale clearing of the catchment for agriculture may impact on all populations by leading to degradation of the species' habitat and, if not addressed, is likely to become worse in the medium to long term. Very high water levels resulted in erosion of the lake edge at Population 1 in 2000.

### Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
<b>1. NW of Ballidu</b>	Unallocated Crown Land	2000 50 2003 76	Healthy	Hydrological changes
<b>2. SW of Koorda</b>	Unallocated Crown Land	2003 200+	Healthy	Hydrological changes
<b>3. SW of Koorda</b>	Unallocated Crown Land	2003 95+	Healthy	Hydrological changes
<b>4. N of Kalannie</b>	Unallocated Crown Land	2003 100+	Moderate	Hydrological changes
<b>5. E of Kalannie</b>	Unallocated Crown Land	2003 1000+	Healthy	Hydrological changes
<b>6A. E of Kalannie</b>	Unallocated Crown Land	2003 100+	Healthy	Hydrological changes
<b>6B. E of Kalannie</b>	Unallocated Crown Land	2003 100+	Healthy	Hydrological changes
<b>7. NW of Latham</b>	Unallocated Crown Land	2003 38	Healthy	Hydrological changes
<b>8. W of Burakin</b>	Shire Reserve	2003 Not counted	Healthy	Hydrological changes
<b>9. Marchagee</b>	Nature Reserve	2003 650	Moderate	Hydrological changes

Populations in **bold text** are considered to be Important Populations

### Guide for decision-makers

Section 1 provides details of current and possible future threats. Proposed developments and on-ground works (clearing, firebreaks etc) in the immediate vicinity of habitat critical to the survival of *Frankenia conferta* will require assessment. Works should not be approved unless the proponents can demonstrate that they will have no significant impact on the species, its habitat or potential habitat, or the local surface or ground water hydrology.

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

Habitat critical to the survival of the species includes the area of occupancy of important populations; areas of similar habitat surrounding important populations (i.e. among other halophytic shrubs on clay sands with gypsum or white-grey shallow sand over clay) provide potential habitat for natural range extension and are necessary to provide habitat for pollinators; the local catchment of the surface and possibly ground waters that maintain the habitat of the species; and additional occurrences of similar habitat that may contain the species or be suitable sites for future translocations.

For most species listed as Vulnerable some populations would be considered more important to the species' ongoing survival than others. These are generally the larger populations, those on conservation estate and those at the extremes of its range. However, on the basis of current knowledge it appears that all the populations of this species are important. This will need to be reappraised when further survey for new populations has been completed and also after the results of genetic studies are known.

### Benefits to other species/ecological communities

There are no other known threatened flora species or ecological communities in the habitat of *Frankenia conferta*. However, recovery actions implemented to improve the quality or security of the habitat of populations of the species are likely to improve the status of the habitat in which they are located.

### International obligations

This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity that was ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. The species is not listed under the United Nations Environment

Program World Conservation Monitoring Centre (UNEP-WCMC) Convention on International Trade in Endangered Species (CITES). In addition, the species is not listed under any other specific international treaty and this Interim Recovery Plan (IRP) does not affect Australia's obligations under these international agreements.

### **Indigenous consultation**

Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council and the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Frankenia conferta*, or groups with a cultural connection to land that is important for the species' conservation, and to determine whether there are any issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. Where no role is identified for the indigenous community associated with this species in the development of the recovery plan, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

### **Social and economic impacts**

The implementation of this recovery plan is unlikely to cause significant adverse social or economic impacts. However, as Population 8 is located on a Shire Reserve its protection may potentially affect Shire activities. In addition, exploration licences have been applied for in the areas containing populations 5 and 7 and subpopulations 6a and 6b. Actions will involve liaison and cooperation with all stakeholders with regard to these areas.

### **Affected interests**

Stakeholders potentially affected by the implementation of this plan include the Shire of Koorda, as the manager of the area that contains Population 8.

### **Evaluation of the Plan's Performance**

DEC will evaluate the performance of this IRP in conjunction with the Avon Mortlock, Moora and Geraldton districts Threatened Flora Recovery Teams. In addition to annual reporting on progress with listed actions and comparison against the criteria for success and failure, the plan is to be reviewed within five years of its implementation.

## **2. RECOVERY OBJECTIVE AND CRITERIA**

### **Objectives**

The objective of this IRP 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 populations have increased or individuals within populations have increased by ten percent or more over the five year term of the plan.

**Criteria for failure:** The number of populations have decreased or individuals within populations have decreased by ten percent or more over the five year term of the plan.

## **3. RECOVERY ACTIONS**

### **Completed recovery actions**



Land managers have been notified of the location and threatened status of the species. The notification details the Declared Rare status of *Frankenia conferta* and associated legal obligations.

An article on the rediscovery of *Frankenia conferta* appeared in the March/April 2001 Newsletter of the former Department of Conservation and Land Management (CALM).

A survey of *Frankenia conferta* and a number of other rare wheatbelt species was undertaken in spring 2003 by Diana Papenfus. Five new populations of the species were located (Papenfus 2003).

Research into the population characteristics of *Frankenia conferta* was undertaken in 2003/2004 by staff from the former Department of CALM Western Australian Threatened Species and Communities Unit (WATSCU) (Harris 2004). The aims of this project were to establish a quantitative monitoring framework and data baseline to obtain information on populations and species growth characteristics and for detecting changes in population abundance, health, life stage structure and reproductive potential. The project included:

- establishing five permanently marked quadrats at five different locations;
- permanently labelling at least 100 *Frankenia conferta* plants for long-term monitoring;
- assessing canopy dimensions of each labelled plant by measuring width;
- assessing health and vigour of each plant by estimating the percentage of live canopy;
- counting the total number of inflorescences on each plant labelled;
- recording life-stage classification of each plant assessed, i.e. mature or juvenile; and
- recording other ecological and biological observations relevant to *F. conferta* populations that will assist in management of the species (eg. soil characteristics) (Harris 2004).

### **Ongoing and future recovery actions**

Staff from DEC's Avon Mortlock, Moora and Geraldton Districts regularly monitor all populations of this species.

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

Where populations occur on lands other than those managed by DEC, permission has been or will be sought from appropriate land managers prior to recovery actions being undertaken. The following recovery actions are roughly in order of descending priority, influenced by their timing over the term of the Plan. However this should not constrain addressing any of the priorities if funding is available for 'lower' priorities and other opportunities arise.

#### **1. Coordinate recovery actions**

The Avon Mortlock, Moora and Geraldton districts Threatened Flora Recovery Teams (MDTFRT, MDTFRT and GDTFRT) will continue to coordinate recovery actions for *Frankenia conferta* and other Declared Rare Flora in their districts. They will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

<b>Action:</b>	Coordinate recovery actions
<b>Responsibility:</b>	DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams
<b>Cost:</b>	\$2,000 per year

#### **2. Map habitat**

It is a requirement of the EPBC Act that spatial data relating to total habitat of the species be determined. Although habitat critical to the species' survival is described in Section 1, the areas as

described have not yet been mapped and that will be redressed under this action. If any additional populations are located, then total habitat will also be determined and mapped for these locations.

**Action:** Map habitat  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts, SCB) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$4,000 in the first year

### 3. Conduct further surveys and confirm populations

Further surveys by DEC staff and community volunteers will be conducted during the flowering period of this species (October). A number of sites that were identified in previous surveys as either containing the species or containing potential habitat for the species will need to be surveyed. In addition most populations were located in a part of a large lake system and further survey is required in the rest of the lake system. Hundreds of a similar looking *Frankenia* plants were found growing adjacent to Population 1 of *F. conferta*. A specimen will be collected to confirm whether this is the same species. In addition, a specimen of the species is required to be collected from Population 9 and identification confirmed. Records of areas surveyed will be sent to SCB and also retained in the relevant districts, even if the species is not found. Population 7 was resurveyed by GDTFRT in 2006 after it was initially recorded in 2003. Two *Frankenia* species were identified and specimens collected, however as they were not in flower there was not enough material for positive identification. The site was surveyed again in 2007, however many of the *Frankenia* plants appeared to be dead. This population requires confirmation, further survey and monitoring.

**Action:** Conduct further surveys and confirm populations  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$7,200 per year

### 4. Collect seed

It is necessary to store germplasm for use in translocations and as an *ex situ* genetic 'blueprint' of the species. The germplasm stored will include seed and live plants in cultivation. No seed has been collected yet, so collections are required from all populations to maintain an adequate representation of the species. The patterns of viability that emerge from standard tests on seed collected may indicate the need for other recovery actions. For example, if viability is consistently low, it may be appropriate to conduct some hand pollination trials.

**Action:** Collect seed  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts, TFSC) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$3,200 in the first, third and fifth years

### 5. Monitor populations

Annual monitoring of factors such as habitat degradation (including weed invasion and plant diseases), population stability (expansion or decline), pollinator activity, grazing, seed production, recruitment, longevity and predation is essential.

**Action:** Monitor populations  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$2,000 per year

### 6. Monitor salinity and groundwater levels

Monitoring bores will need to be installed in most populations to monitor groundwater levels. Soil salinity and pH readings will also be taken annually during winter (as per methods used in Harris 2004). Soil samples may be collected using an auger to provide a soil profile. The monitoring results will continue to be examined and the implications for management determined. If the decline of the species is confirmed at population 7, monitoring may be particularly valuable in identify factors that have contributed to its decline.

**Action:** Monitor salinity and groundwater levels  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$10,500 in year one; \$4,500 per year thereafter

## 7. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Frankenia conferta* will provide a scientific basis for its management in the wild. The five quadrats established at Populations 2, 3, 4 and 5 in 2003/2004 will provide a basis for re-monitoring (Harris 2004). An understanding of the following is necessary for effective management:

1. Soil seed bank dynamics, including seedbank location and viability.
2. The role of various disturbances (including fire), competition, rainfall and grazing in germination and recruitment.
3. The pollination biology of the species.
4. The requirements of pollinators.
5. The reproductive strategies, phenology and seasonal growth of the species.
6. The population genetic structure, levels of genetic diversity and minimum viable population size.

**Action:** Obtain biological and ecological information  
**Responsibility:** DEC (Science Division, Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$12,500 per year in the first, second and third years

## 8. Promote awareness

The importance of biodiversity conservation and the need for the long-term protection of wild populations of *Frankenia conferta* 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 will be produced, and will include a description of the plant, its habitat, threats, recovery actions and photos. This will be distributed to the public through DEC's Avon Mortlock, Moora and Geraldton District offices and at the offices and libraries of the Shires of Koorda, Dalwallinu, Perenjori and Coorow. Such information distribution may lead to the discovery of new populations.

**Action:** Promote awareness  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$1,300 in first year; \$600 per year thereafter

## 9. Achieve long-term protection of habitat

Ways and means of improving the security of populations of *Frankenia conferta* and its habitat will be investigated. On private land, this may include conservation covenants with a range of agencies, or registration through the Land for Wildlife Scheme. The reservation status of the land parcel that supports Population 1 should be reviewed, and the possibility of additional protection through the reservation system investigated.

**Action:** Achieve long-term protection of habitat

**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$1,500 per year

#### 10. Liaise with relevant land managers

Staff from DEC's Avon Mortlock, Moora and Geraldton Districts will continue to liaise with relevant land managers to ensure that populations are not accidentally damaged or destroyed. Input and involvement will also be sought from any Aboriginal groups that have an active interest in areas that are habitat for *Frankenia conferta*.

**Action:** Liaise with relevant land managers  
**Responsibility:** DEC (Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$900 per year

#### 11. Review the IRP and assess the need for further recovery actions

If *Frankenia conferta* is still ranked VU at the end of the fourth year of the five-year term of this IRP, the plan will be reviewed and the need for further recovery actions assessed.

**Action:** Review the IRP and assess the need for further recovery actions  
**Responsibility:** DEC (SCB, Avon Mortlock, Moora & Geraldton Districts) through the AMTFRT, MDTFRT and GDTFRT recovery teams  
**Cost:** \$22,700 in the fifth year (if required)

## 4. TERM OF PLAN

### Western Australia

This IRP will operate from April 2008 to March 2013 but will remain in force until withdrawn or replaced. If the species is still ranked VU after five years, the need for further recovery actions and an update of this IRP will be assessed.

### Commonwealth

In accordance with the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) this adopted recovery plan will remain in force until revoked.

The recovery plan must be reviewed at intervals of not longer than 5 years.

## 5. REFERENCES

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## 6. TAXONOMIC DESCRIPTION

Diels, L. and Pritzel, E. (1904) *Fragmenta phytographiae Australiae occidentalis : Beitrage zur kenntnis der Pflanzen Westaustraliens, ihrer Verbreitung und ihrer Lebens-Verhaltnisse. Botanische Jahrbucher fur Systematik, Pflanzengeschichte und Pflanzengeographie* 35, 389.

*Frankenia conferta* **Diels n. sp.** folia 4-5 mm long, ca. 1 mm crassa. Calyx 4mm long; corolla 6 mm long; stamina 4-5 mm, anthera 1 mm long; ovarium 2 mm, stylus 4-5 mm long.

