INTERIM RECOVERY PLAN NO. 116

SALT MYOPORUM

(*MYOPORUM TURBINATUM*)

INTERIM RECOVERY PLAN

2002-2007

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Government of Western Australia

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This Interim Recovery Plan will operate from February 2002 to January 2007 but will remain in force until withdrawn or replaced.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 replaced by a full Recovery Plan after five years.

This IRP was approved by the Acting Director of Nature Conservation on 24 September, 2002. 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 May 2002.

SUMMARY

Scientific Name:	***Myoporum turbinatum***	**Common Name:**	Salt Myoporum
Family:	Myoporaceae	**Flowering Period:**	May; October to February
Dept Region:	South Coast	**Dept District:**	Esperance
Shire:	Esperance	**Recovery Team:**	To be established

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; Chinnock, R.J. (1986) Five endangered new species of Myoporaceae from south-western Australia. *Nuytsia* 5(3), 391-400.

Current status: *Myoporum turbinatum* was declared as Rare Flora in September 1987, ranked as Endangered (EN) in May 1997 and recommended for ranking as Critically Endangered in October 2001. It currently meets World Conservation Union (IUCN, 2000) Red List Category 'CR' under criteria B1ab(iii,v)+2ab(iii,v); C2a(i) due to the severe fragmentation of populations and continuing decline in the area, extent and quality of habitat and the number of mature individuals. The main threats are road and firebreak maintenance, salinity, weeds, inappropriate fire regimes and poor recruitment.

Critical habitat: The critical habitat for *Myoporum turbinatum* comprises the area of occupancy of the known populations; similar habitat within 200 metres of known populations; corridors of remnant vegetation that link populations and additional nearby occurrences of similar habitat that do not currently contain the species but may have done so and may be used for translocations.

Habitat requirements: *Myoporum turbinatum* is currently known from a range of less than 15 km in an area north east of Esperance. It grows on margins of saline depressions in sandy duplex soils in mallee heath scrub with *Melaleuca*, *Hakea laurina* and *Eucalyptus* species (Brown *et al*. 1998).

Existing Recovery Actions: The following recovery actions have been or are currently being implemented –
1. Land managers and adjacent landowners have been made aware of the location and threatened status of the species.
2. Approximately 372 seeds were collected from Subpopulation 4g in January 1994 and are stored in the Department's Threatened Flora Seed Centre at –18°C.
3. The Botanic Garden and Parks Authority currently have four plants of *Myoporum turbinatum* from a single clone.
4. Staff from the Department's Esperance District are overseeing the implementation of this IRP and will include information on progress in an annual report to the Department's Corporate Executive and funding bodies.
5. Staff from the Department's Esperance District regularly monitor populations of the 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.
Criteria for failure: The number of individuals within populations and/or the number of populations have decreased.

Recovery actions
1. Establish a Threatened Flora Recovery Team.
2. Install Declared Rare Flora markers.
3. Conduct further surveys.
4. Stimulate the germination of soil-stored seed.
5. Undertake weed control.
6. Develop and implement a fire management strategy.
7. Monitor populations.
8. Rehabilitate habitat.
9. Collect seed and cutting material.
10. Liaise with land managers.
11. Promote awareness.
12. Start the translocation process.
13. Obtain biological and ecological information.
14. Write a full Recovery Plan.

1. BACKGROUND

History

Bob Chinnock made the first collection of *Myoporum turbinatum* from an area to the northeast of Esperance in 1981 [1]. Although this population has not been relocated, a further six small populations containing a total of 57 mature plants have been found in the same general area. There is a large amount of potential habitat adjoining this area and the species may be more widespread than is currently known.

The preferred habitat of *Myoporum turbinatum* may place the species at future risk from rising salinity that is expanding outwards from the saline lakes on whose margins it occurs. In these areas tree deaths and the presence of salt tolerant species are already evident.

Description

Myoporum turbinatum is an erect shrub to 4 m tall. When young it is multi-stemmed and broom-like but when mature consists of one or a few long slender stems with leafy branches that are restricted to the uppermost part. The species has sticky branches with prominent wart-like projections. The shiny, dark green linear leaves, which are 11 to 80 mm long by 1 mm wide with a distinctly grooved midrib, also have prominent wart-like projections and are arranged alternately along the stem. The leaf margins have small conical teeth that are more obvious towards the tip. The dull, white flowers are often tinged with lilac and have four stamens that protrude just beyond the petals. Four to eight flowers are held in each leaf axil. Flattened fruits are beaked at the end and have four ribs or wings (Brown *et al*. 1998).

Myoporum turbinatum is closely related to *M. platycarpum* and have similar fruits. The fruit of *M. turbinatum* however, is not flattened in the lower half (Chinnock 1986).

Distribution and habitat

Myoporum turbinatum is currently known from a narrow geographic range of less than 15 km to the north east of Esperance, where it grows on margins of saline depressions in sandy duplex soils in mallee heath scrub with *Melaleuca*, *Hakea laurina* and various *Eucalyptus* (Brown *et al*. 1998).

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 that the potential to be reintroduced. (*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)).

The critical habitat for *Myoporum turbinatum* comprises:

- the area of occupancy of known populations.
- areas of similar habitat within 200 metres of known populations, i.e. sandy duplex soils in mallee heath scrub on the margins of saline depressions (these provide potential habitat for natural range extension).
- corridors of remnant vegetation that link populations (these are necessary to allow pollinators to move between populations and are usually road and rail verges).
- the local catchment area (the species occurs on the margins of saline depressions which are dependent on the maintenance of local surface and ground water hydrology).
- additional occurrences of similar habitat that do not currently contain the species but may have done so in the past (these represents possible translocation sites).

[1] Bob Chinnock Botanist, Adelaide Herbarium

Biology and ecology

Members of the *Myoporaceae* are often suitable ornamental garden plants. Most adapt well to cultivation and generally withstand extended dry periods, frosts, alkaline and salty soils (Richmond and Ghisalberti 1995).

Threats

Myoporum turbinatum was declared as Rare Flora in September 1987, ranked as Endangered (EN) in May 1997 and recommended for ranking as Critically Endangered in October 2001. It currently meets World Conservation Union (IUCN, 2000) Red List Category 'CR' under criteria B1ab(iii,v)+2ab(iii,v); C2a(i) due to the severe fragmentation of populations and continuing decline in the area, extent and quality of habitat and the number of mature individuals. The main threats are road and firebreak maintenance, salinity, weeds, inappropriate fire regimes and poor recruitment.

- **Road and firebreak maintenance** threatens all road reserve populations and most populations on private property. Threats include grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion.

- **Rising saline water tables** are likely to be a future threat. All populations occur adjacent to salt lakes in seasonally wet/waterlogged areas that are showing signs of increasing salinity.

- **Weed invasion** is a minor threat to all populations. 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 grass weed species.

- **Inappropriate fire regimes** may affect the viability of populations. It is not known how the species responds to fire, however, overly frequent fire is likely to kill plants before they reach maturity.

- **Poor recruitment** threatens most populations with few seedling plants being observed.

- **Wind** is a threat to Subpopulation 4g. Lack of native vegetation has exposed the site to wind and resulted in broken branches on *Myoporum turbinatum*.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1. NE of Esperance	Shire Road Reserve	1989 3 2001 0	Moderate	Road maintenance, salinity, weed invasion, inappropriate fire, poor recruitment
2a. NE of Esperance	Shire Road Reserve	1989 *8 [1 dead] 2001 0	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment
2b. NE of Esperance	Private Property	1989 *8 [1 dead] 2001 0	Poor	Firebreak maintenance, salinity, weed invasion, inappropriate fire, poor recruitment
3a. NE of Esperance	A Class Nature Reserve	1989 *16 (2) 2001 0	Moderate	Salinity, firebreak maintenance, weed invasion, inappropriate fire, poor recruitment
3b. NE of Esperance	Shire Road Reserve	1989 *16 (2) 2001 0	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment
4a. NE of Esperance	Shire Road Reserve	1989 *40 2001 2 (12) [1 dead]	Moderate	Road maintenance, salinity, weeds, inappropriate fire
4b. NE of Esperance	Private Property	1989 *40 2001 0	Cleared	Weed invasion, inappropriate fire, poor recruitment
4c. NE of Esperance	Shire Road Reserve	1992 3 [1 dead] 2001 1	Moderate	Road maintenance, salinity, weed invasion, inappropriate fire, poor recruitment
4d. NE of Esperance	Shire Road Reserve	1992 30 [22 dead] 2001 4	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment
4e. NE of Esperance	Shire Road Reserve	1989 *30 (3) 2001 5	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment
4f. NE of Esperance	Private Property	1989 *30 (3) 2001 0	Moderate	Firebreak maintenance, salinity, weed invasion, inappropriate fire, poor recruitment
4g. NE of Esperance	Shire Road Reserve	1992 23 [2 dead] 2001 42 (14) [9 dead]	Moderate	Road maintenance, weed invasion, salinity, inappropriate fire, wind
4h. NE of Esperance	Shire Road Reserve	2001 2	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment
5a. NE of Esperance	Shire Road	1992 *16 (2)	Moderate	Road maintenance, weed invasion,

	Reserve	2001 0		inappropriate fire, poor recruitment
5b. NE of Esperance	Private Property	1992 *16 (2) 2001 0	Moderate	Salinity, inappropriate fire, poor recruitment
6. NE of Esperance	Shire Road Reserve	2001 1	Moderate	Road maintenance, weed invasion, inappropriate fire, poor recruitment

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

Guide for decision-makers

Section 1 provides details of current and possible future threats. Any on-ground works (firebreaks, roadworks etc) in the immediate vicinity of *Myoporum turbinatum* will require assessment. On ground works should not be approved unless the proponents can demonstrate that they will not have an impact on the species, its habitat or potential habitat, or on the local surface hydrology such that drainage in the habitat of the species would be altered.

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

3. RECOVERY ACTIONS

Existing recovery actions

The majority of land managers and adjacent landowners have been notified of the location and threatened status of the species. The notification details the Declared Threatened status of the taxon and legal responsibilities to protect it.

Approximately 372 seeds (from 1128 fruits) were collected from Subpopulation 4g in January 1994 and are stored in the Department's TFSC at –18°C. Staff from the TFSC test the viability of seed soon after collection and again after one year in storage. The initial germination rate of *Myoporum turbinatum* seed was 43%. After one year of storage the germination rate ranged from 50 to 67% (unpublished data A. Cochrane[2]).

The BGPA currently have four plants of *Myoporum turbinatum* that are clones from a single plant. The species has been difficult to propagate, although there has been limited work using cuttings (personal communication A. Shade[3]).

Once established, the Esperance District Threatened Flora Recovery Team (EDTFRT) will oversee the implementation of this IRP and will include information on progress in its annual report to the Department's Corporate Executive and funding bodies.

Staff from the Department's Esperance District are regularly monitoring populations of this species.

[2] Anne Cochrane, Manager, the Department's Threatened Flora Seed Centre
[3] Amanda Shade, Horticulturalist, Botanic Garden and Parks Authority

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. Establish a Threatened Flora Recovery Team

Once established, the Esperance District Threatened Flora Recovery Team (EDTFRT) will coordinate recovery actions for *Myoporum turbinatum* and other Declared Rare flora in the district.

Action: Establish a Threatened Flora Recovery Team
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $2,500 per year.

2. Install Declared Rare Flora markers

Declared Rare Flora (DRF) markers are required on all road reserve populations. Their purpose is to alert people of the presence of DRF.

Action: Install DRF markers
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $900 in first year.

3. Conduct further surveys

Further surveys by Departmental staff and community volunteers will be conducted during the flowering period of the species (May and October to February).

Action: Conduct further surveys
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $3,000 per year.

4. Stimulate the germination of soil-stored seed

Burning, smokewater and soil disturbance may be effective in stimulating the germination of soil-stored seed. These trials will be conducted around dead *Myoporum turbinatum* plants and in the areas of extinct populations.

Action: Stimulate the germination of soil-stored seed
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $4,400 in first and second years, $1,000 in subsequent years.

5. Undertake weed control

Weeds are a minor threat in all populations. The following actions will be implemented:

1. Appropriate herbicides will be selected after determining which weeds are present.
2. Invasive weeds around plants of *Myoporum turbinatum* will be controlled by hand removal or spot spraying when weeds first emerge.
3. Weed control will be scheduled to include spraying of other threatened flora populations within the district.

Action: Undertake weed control
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $800 per year.

6. Develop and implement a fire management strategy

It is thought that fire kills adult plants of the species and regeneration is largely from seed. However, frequent fire may prevent the accumulation of sufficient soil-stored seed for recruitment to occur. Fire should therefore be prevented from occurring in the area of populations, except where it is being used experimentally 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 (Esperance District) through the EDTFRT
Cost: $2,600 in first year and $1,000 in subsequent years.

7. Monitor populations

Annual monitoring of factors such as habitat degradation, salinity, wind damage, population stability (expansion or decline), weed invasion, pollination activity, seed production, recruitment, longevity and predation is essential.

Action: Monitor populations
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $2,500 per year.

8. Rehabilitate habitat

If identified as a need during monitoring the Department will undertake habitat restoration in Subpopulation 4g, including the re-introduction of endemic plant species to the site.

Action: Rehabilitate habitat
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $2,900 in first and second years and $1000 in subsequent years.

9. Collect seed and cutting material

Preservation of germplasm is essential to guard against extinction if wild populations are lost. Such collections are also needed to propagate plants for translocations. A small quantity of seed has been collected from Subpopulation 4g but further collections are required from both it and other populations. At this time cuttings will also be obtained to enhance the living collection at the BGPA.

Action: Collect seed and cutting material
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $4,100 for the first two years and $1,000 in subsequent years.

10. Liaise with land managers

Staff from the Department's Esperance District will continue Liaising with land managers and landowners to ensure that populations are not accidentally damaged or destroyed.

Action: Liaise with land managers
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $800 per year.

11. 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 the local print and electronic media and poster displays. 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 will be produced.

A reply paid postal drop illustrating *Myoporum turbinatum* and describing its distinctive features and habitat will be produced and distributed by the Department's Esperance District office to local farmers and other residents in Shires containing possible habitat of the species. Postal drops aim to provide information about threatened species and a contact name and number if new populations are found.

Action: Promote awareness
Responsibility: The Department (Esperance District) through the EDTFRT
Cost: $1,900 in first year, $1,200 in second year and $900 in subsequent years.

12. Start the translocation process

As the number of extant plants is low and populations are not secure from threats a translocation proposal will be developed and suitable translocation sites selected. This will coordinated by the EDTFRT. 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.

Action: Start the translocation process
Responsibility: The Department (Science Division, Esperance District) through the EDTFRT
Cost: $5,500 in the third year and $4,000 in the fifth year.

13. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Myoporum turbinatum* will provide a better scientific basis for its management in the wild and will include:

1. Studying the soil seed bank dynamics and the role of various disturbance (such as fire), competition, rainfall and grazing in recruitment and seedling survival.
2. Investigating the pollination biology of the species.
3. Determining the reproductive methodology, phenology and seasonal growth of the species.
4. Investigating the population genetic structure, levels of genetic diversity and minimum viable population size.
5. Studying the impact of salinity on *Myoporum turbinatum* and its habitat.

Action: Obtain biological and ecological information
Responsibility: The Department (Science Division, Esperance District) through the EDTFRT
Cost: $20,900 per year for the first three years.

14. Write a full Recovery Plan

At the end of the fourth year of the five-year term of this Interim Recovery Plan, the need for further recovery will be assessed. If the species is still ranked as Critically Endangered at that time a full Recovery Plan will be developed that prescribes actions required for its long-term recovery.

Action: Write a full Recovery Plan
Responsibility: The Department (WATSCU, Esperance District) through the EDTFRT
Cost: $20,300 in the fifth year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from February 2002 to January 2007 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 replaced by a full Recovery Plan after five years.

5. ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this Interim Recovery Plan:

Klaus Tiedemann	District Manager, the Department's Esperance District
Anne Cochrane	Manager, the Department's Threatened Flora Seed Centre
Les Coyne	Wildlife Officer, the Department's Esperance District
Bernie Haberley	District Wildlife Officer, the Department's Esperance District
John Riley	Technical Officer, the Department's Wildlife Branch

Amanda Shade Horticulturalist, Botanic Garden and Parks Authority

We would like to thank the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and the Department's Wildlife Branch for their extensive assistance.

6. REFERENCES

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The Department (1998) Western Australian Herbarium FloraBase – Information on the Western Australian Flora. Department of Conservation and Land Management, Western Australia. http://www.calm.wa.gov.au/science/

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7. TAXONOMIC DESCRIPTION

Chinnock, R.J. (1986) Five endangered new species of Myoporaceae from south-western Australia. *Nuytsia* 5(3), 391-400.

Myoporum turbinatum is an erect shrub to 4 m high, at first multistemmed and broom-like, but eventually consisting of one or a few long slender erect stems with leafy branches restricted to uppermost part. *Branches* greenish brown, light brown to purplish brown in older parts, prominently tuberculate, glabrous, glandular-papillose, viscid, more or less granulate and frequently spiculose at least when dry. *Leaves* sessile, alternate, erect, straight or incurved, deep green or immature leaves sometimes reddish brown, linear, flat to subterete, (10.5) 15-50(80) x 0.5-1(1.5) mm, uncinate, margin with small conical teeth especially in the distal half, surface tuberculate and often spiculose, midrib distinctly grooved on both surfaces, glabrous, viscid, shiny. *Flowers* 4 to 8 per axil; pedicel 1.5-4.5 mm long, dilated in upper part and 5-ribbed when dry, glabrous, glandular-papillose, viscid. *Sepals* 5, valvate, green, narrowly triangular, c. 1 x 0.3 mm, keeled, glabrous. *Corolla* 2.5-4.5 mm long, almost rotate, white but often tinged lilac, unspotted or with irregular sized blotches on lower half of lobes and in tube; glabrous outside but often spiculose when dry, inside of lobes and tube with a few scattered hairs; lobes obtuse, equal in size but one distinctly pouched. *Stamens* 4, exserted, glabrous. *Ovary* conical but obscurely 4-sided, 1-1.5 x 0.5 mm, purplish black, bilocular with one ovule per loculus, rugose to tuberculate, glabrous; style glabrous. *Fruit* dry, turbinate, 3-4.5 x 1.5-2.5 mm, prominently flattened and beaked in distil part, 4-ribbed to 4-winged, wings membranous and translucent at least near apex, glabrous.