

SALT MYOPORUM

(*MYOPORUM TURBINATUM*)

INTERIM RECOVERY PLAN

2004-2009

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Photograph: A. Cochrane

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FOREWORD

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

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

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

This Interim Recovery Plan results from a review of, and replaces, IRP No.116 *Myoporum turbinatum* (Phillimore and Brown, 2002). The plan will operate from July 2004 to June 2009 but will remain in force until withdrawn or replaced. It is intended that, at the end of the fourth year of the five-year term of this IRP, if the taxon is still ranked as Critically Endangered, the need for further recovery or a revision of this IRP will be assessed and a plan prepared if necessary.

This IRP was given regional approval 11 November, 2004 and was approved by the Director of Nature Conservation on 24 December, 2004. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at July 2004.

ACKNOWLEDGMENTS

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

| | |
|-----------------|---|
| Klaus Tiedemann | District Manager, CALM's Esperance District |
| Mike Fitzgerald | Nature Conservation Coordinator, Esperance District |
| Anne Cochrane | Manager, CALM's Threatened Flora Seed Centre |
| Les Coyne | Wildlife Officer, CALM's Esperance District |
| Bernie Haberley | Ex-District Wildlife Officer, CALM's Esperance District |
| John Riley | Administrative Officer, CALM's Wildlife Branch |
| Amanda Shade | Horticulturalist, Botanic Gardens 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 CALM's Wildlife Branch for their extensive assistance.

SUMMARY

| | | | |
|-------------------------|----------------------------|--------------------------|--|
| Scientific Name: | <i>Myoporum turbinatum</i> | Common Name: | Salt Myoporum |
| Family: | Myoporaceae | Flowering Period: | October to May |
| CALM Region: | South Coast | CALM District: | Esperance |
| Shire: | Esperance | Recovery Team: | Esperance District Threatened Flora Recovery Team (EDTFRT) |

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; The Department of Conservation and Land Management (1998) *Florabase – Information on the Western Australian Flora* (<http://www/calm.wa.gov.au/science/>).

Current status: *Myoporum turbinatum* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act* 1950 in September 1987 and ranked as Critically Endangered in October 2001. It currently meets World Conservation Union (IUCN, 2000) Red List Category Critically Endangered (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 species is also listed as Endangered (EN) under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The main threats are road and firebreak maintenance, salinity, weeds, inappropriate fire regimes and poor recruitment.

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).

Habitat requirements: *Myoporum turbinatum* is currently known from a range of less than 15 km in an area 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* species.

Critical habitat: The critical habitat for *Myoporum turbinatum* comprises the area of occupancy of 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 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 to its survival. Survey for further populations may lead to the identification of additional habitat critical to the survival of the species.

Benefits to other species/ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Myoporum turbinatum* will also improve the status of remnant vegetation in which it is located.

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. The taxon is not specifically listed under any international treaty, however, and this Interim Recovery Plan (IRP) does not affect Australia's obligations under any other international agreements.

Role and interests of indigenous people: According to the Department of Indigenous Affairs Aboriginal Heritage Sites Register, no sites have been found in the vicinity of *Myoporum turbinatum* populations. However, input and involvement will be sought from any Aboriginal groups that have an active interest in the areas that are habitat *M. turbinatum*, and this is discussed under the relevant recovery actions.

Social and economic impacts: The implementation of this interim recovery plan has the potential to have some minimal social and economic impact as some populations are located on private property. Recovery actions refer to continued liaison between stakeholders with regard to these areas.

Evaluation of the Plan's Performance: The Department of Conservation and Land Management (CALM), in conjunction with the Esperance District Threatened Flora Recovery Team (EDTFRT) 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.

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. Declared Rare Flora (DRF) markers have been erected for all road reserve populations.
3. Approximately 372 seeds were collected from Subpopulation 4g in January 1994 and are stored in the Department's Threatened Flora Seed Centre (TFSC) at –18°C. Further seed was collected from plants at Subpopulations 2c, 4a and 4g in January 2004 and stored at the TFSC, however these are yet to be counted.
4. The Botanic Gardens and Parks Authority (BGPA) currently have 108 plants of *Myoporum turbinatum* in cultivation. The plants are derived from three clones grown from cutting material collected between 1993 and 2003.
5. Excess plants from the BGPA are being used in preliminary salinity and waterlogging trials, scheduled to start later this year (2004).
6. The Esperance District Threatened Flora Recovery Team (EDTFRT) is overseeing the implementation of this IRP and will include information on progress in annual reports to CALM's Corporate Executive and funding bodies.
7. Staff from CALM's Esperance District regularly monitor populations of the species.

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 individuals within populations and/or the number of populations have increased by ten percent or more over the five year term of this IRP.

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

Recovery actions

1. Coordinate recovery actions
2. Map critical habitat
3. Undertake hydrological threat analysis
4. Develop and implement a fire management strategy
5. Stimulate the germination of soil-stored seed
6. Start the translocation process
7. Conduct further surveys
8. Monitor populations
9. Collect seed and cutting material
10. Undertake weed control
11. Liaise with land managers
12. Promote awareness
13. Obtain biological and ecological information
14. Review this IRP

1. BACKGROUND

History

Bob Chinnock¹ made the first collection of *Myoporum turbinatum* from an area to the northeast of Esperance in 1981. Although this population has not been relocated, a further six small populations containing a total of 171 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*. 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 approximately 80km to the north east of Esperance, where it grows with *Melaleuca*, *Hakea laurina* and various *Eucalyptus* species in sandy duplex soils on the margins of saline depressions (Brown *et al.* 1998).

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). The plants and flowers in the *Myoporaceae* family are also hermaphrodite (CALM, 1998).

It is believed that fire kills adult plants of the species and regeneration is largely from seed, however there has been no specific research conducted on the taxon. The susceptibility of *M. turbinatum* to dieback disease (caused by *Phytophthora* spp.) and disturbance are unknown and require research.

Threats

Myoporum turbinatum was declared as Rare Flora under the *Western Australian Wildlife Conservation Act* (1950) in September 1987, and ranked 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, continuing decline in the area, extent and quality of habitat and decline the number of mature individuals. The species is also listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The main threats are:

- **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.

¹ Bob Chinnock, Botanist, Adelaide Herbarium

- **Rising saline water tables** are likely to be a future threat. All populations are adjacent to salt lakes in seasonally wet/waterlogged areas that are showing signs of rising 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 that 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 2003 0 | Poor | Road maintenance, salinity, weed invasion, inappropriate fire, poor recruitment |
| 2a. NE of Esperance | Shire Road Reserve | 1989 *8 [1 dead] 2001 0 2003 0 | Poor | Road maintenance, weed invasion, inappropriate fire, poor recruitment |
| 2b. NE of Esperance | Private Property | 1989 *8 [1 dead] 2001 0 2003 0 | Poor | Firebreak maintenance, salinity, weed invasion, inappropriate fire, poor recruitment |
| 2c. NE of Esperance | Shire Road Reserve | 2003 75 [8 dead] | Healthy | Road maintenance, weed invasion, inappropriate fire |
| 3a. NE of Esperance | A Class Nature Reserve | 1989 *16 (2) 2001 0 2003 0 | Poor | 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] 2003 16 | Healthy | 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 2003 0 | Moderate | Road maintenance, salinity, weed invasion, inappropriate fire, poor recruitment |
| 4d. NE of Esperance | Shire Road Reserve | 1992 30 [22 dead] 2001 4 2003 2 | Moderate | Road maintenance, weed invasion, inappropriate fire, poor recruitment |
| 4e. NE of Esperance | Shire Road Reserve | 1989 *30 (3) 2001 5 2003 4 | 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] 2003 69 [4 dead] | Healthy | Road maintenance, weed invasion, salinity, inappropriate fire, wind |
| 4h. NE of Esperance | Shire Road Reserve | 2001 2 2003 1 | Moderate | Road maintenance, weed invasion, inappropriate fire, poor recruitment |
| 4i. NE of Esperance | Shire Road Reserve | 2004 4 (est.>100) | Healthy | Salinity, weed invasion, inappropriate fire |
| 5a. NE of Esperance | Shire Road Reserve | 1992 *16 (2) 2001 0 2003 0 | Moderate | Road maintenance, weed invasion, 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 all subpopulations combined.

Guide for decision-makers

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

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 population 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 that 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).

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 for its survival. Survey for further populations may lead to the identification of additional habitat critical to the survival of the species.

Benefits to other species/ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Myoporum turbinatum* will also improve the general condition of remnant vegetation in which populations are located.

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. *Myoporum turbinatum* is not specifically listed under any international treaty, however, and this plan does not affect Australia's obligations under any other international agreements.

Role and interests of indigenous people

According to the Department of Indigenous Affairs Aboriginal Heritage Sites Register, no sites have been found in the vicinity of *Myoporum turbinatum* populations. However, input and involvement will be sought from any Aboriginal groups that have an active interest in the areas that are habitat *M. turbinatum*, and this is discussed under the relevant recovery actions.

Social and economic impacts

The implementation of this interim recovery plan has the potential to have some minimal social and economic impact as some populations are located on private property. Recovery actions refer to continued liaison between stakeholders with regard to these areas.

Evaluation of the Plans Performance

CALM, in conjunction with the Esperance District Threatened Flora Recovery Team 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.

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.

Recovery criteria

Criteria for success: The number of individuals within populations and/or the number of populations have increased by ten percent or more over the five year term of this IRP.

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

3. RECOVERY ACTIONS

Existing recovery actions

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

Declared Rare Flora (DRF) markers have been erected for all road reserve populations.

Approximately 372 seeds were collected from Subpopulation 4g in January 1994 and are stored in the Department's Threatened Flora Seed Centre (TFSC) at -18°C . Further seed was collected from plants at Subpopulations 2c, 4a and 4g in January 2004 and stored at the TFSC, however these are yet to be counted. Staff from the TFSC tested the viability of seed soon after collection in 1994 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. Cochrane²).

The Botanic Gardens and Parks Authority (BGPA) currently have 108 plants of *Myoporum turbinatum* in cultivation. The plants are derived from three clones grown from cutting material collected between 1993 and 2003. Early indications are that the species propagates effectively from cuttings and that seed viability is very good (100%) (A. Shade³, personal communication).

Excess plants from the BGPA are being used in preliminary salinity and waterlogging trials, scheduled to start later this year (2004).

² Anne Cochrane, Manager, CALM's Threatened Flora Seed Centre

³ Amanda Shade, Horticulturalist, Botanic Garden and Parks Authority

The Esperance District Threatened Flora Recovery Team (EDTFRT) is overseeing the implementation of this IRP and will include information on progress in annual reports to CALM's Corporate Executive and funding bodies.

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

Future recovery actions

Where populations occur on lands other than those managed by CALM, 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, however, this should not constrain addressing any action for those listed as 'lower' priorities if funding is available or other opportunities arise.

1. Coordinate recovery actions

The Esperance District Threatened Flora Recovery Team (EDTFRT) coordinates recovery actions for *Myoporum turbinatum* and includes information on progress in annual reports to CALM's Corporate Executive and funding bodies.

Action: Coordinate recovery actions.
Responsibility: CALM (Esperance District) through the EDTFRT.
Cost: \$1,500 per year.

2. Map critical habitat

It is a requirement of the EPBC Act that spatial data relating to critical habitat be determined. Although critical habitat is described in Section 1, the areas as described have not yet been mapped and that will be done under this action. If additional populations are located, then critical habitat will be determined and mapped for them also.

Action: Map critical habitat
Responsibility: CALM (Esperance District) through the EDTFRT
Cost: \$1,500 in the first year

3. Undertake hydrological threat analysis

Salinisation is recognized as a major threatening process to the taxon and its associated habitat. Hydrology requires the installation of observation bores and data loggers, and regular monitoring, enabling extrapolative data that will lead to analysis of the threat levels, to *Myoporum turbinatum* and associated species.

Action: Undertake hydrological threat analysis
Responsibility: CALM (Esperance District) through the EDTFRT
Cost: \$7,000 in year 1, \$3,500 in years 2 and 3

4. 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 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: CALM (Esperance District) through the EDTFRT.
Cost: \$2,600 in first year and \$1,000 in subsequent years.

5. Stimulate the germination of soil-stored seed

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

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

6. 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 be coordinated by the EDTFRT. Information on the translocation of threatened animals and plants in the wild is provided in CALM'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: CALM (Science Division, Esperance District) through the EDTFRT
Cost: \$5,500 in the third year and \$4,000 in the fifth year.

7. Conduct further surveys

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

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

8. Monitor populations

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

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

9. Collect seed and cutting material

Myoporum turbinatum seed has been collected in the past. However, further collection is highly desirable. Collecting seed from all populations and from a range of plants will ensure an adequate representation of genetic diversity. Further collection of cutting material is also desirable. It is also important that the size and viability of the soil seed bank is determined and further research is undertaken to develop techniques for stimulating germination of soil-stored seed.

Action: Collect seed and cutting material.
Responsibility: CALM (Esperance District) through the EDTFRT.
Cost: \$1,000 per year.

10. 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 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: CALM (Esperance District) through the EDTFRT.
Cost: \$800 per year.

11. Liaise with land managers

Staff from CALM's Esperance District will continue Liaising with the land managers and landowners to ensure that populations are not accidentally damaged or destroyed. Input and involvement will also be sought from Aboriginal groups found to have an active interest in areas that are habitat for *Myoporum turbinatum*.

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

12. 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 photographs will be produced.

A reply paid postal drop illustrating *Myoporum turbinatum* and describing its distinctive features and habitat will be produced and distributed by CALM'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: CALM (Esperance District) through the EDTFRT
Cost: \$1,900 in first year, \$1,200 in second year and \$900 in subsequent years.

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 method, 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 and waterlogging on *Myoporum turbinatum* and its habitat.

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

14. Review this IRP

If *Myoporum turbinatum* is still ranked as Critically Endangered at the end of the fourth year of the five-year term of this IRP, the need for further recovery or a revision of this IRP will be assessed and a plan prepared if necessary.

Action: Review this IRP
Responsibility: CALM (WATSCU, Esperance District) through the EDTFRT
Cost: \$15,700 in the fifth year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from July 2004 to June 2009 but will remain in force until withdrawn or replaced. If the taxon is still ranked as Critically Endangered after five years, the need to review this IRP will be determined.

5. REFERENCES

- Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998) *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Perth, Western Australia.
- Chinnock, R.J. (1986) Five Endangered New species of Myoporaceae from South-western Australia. In *Nuytsia*, Vol 5 (3); 398-399.
- Phillimore, R. and Brown, A. (2002). Interim Recovery Plan No. 116: Salt Myoporum (*Myoporum turbinatum*). The Department of Conservation and Land Management, Perth Western Australia.
- CALM (1992) Policy Statement No. 44 *Wildlife Management Programs*. Department of Conservation and Land Management, Perth, Western Australia.
- CALM (1994) Policy Statement No. 50 *Setting Priorities for the Conservation of Western Australia's Threatened Flora and Fauna*. Department of Conservation and Land Management, Perth, Western Australia.
- CALM (1995) Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. Department of Conservation and Land Management, Perth, Western Australia.
- CALM (1998) *Western Australian Herbarium FloraBase* – Information on the Western Australian Flora. Department of Conservation and Land Management, Perth, Western Australia.

6. TAXONOMIC DESCRIPTION

Chinnock, R.J. (1986) Five Endangered New species of Myoporaceae from South-western Australia. In *Nuytsia*, Vol 5 (3); 398-399.

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, uncinata, 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 or 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 distal part, 4-ribbed to 4-winged, wings membranous and translucent at least near apex, glabrous.

SUMMARY OF RECOVERY ACTIONS AND COSTS

| Recovery Actions | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | |
|--|---------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|--------------|---------------|--------------|---------------|---------------|---------------|
| | Dept | Other | Ext. | Dept | Other | Ext. | Dept | Other | Ext. | Dept | Other | Ext. | Dept | Other | Ext. |
| Coordinate recovery actions | 1,400 | 0 | 100 | 1,400 | 0 | 100 | 1,400 | 0 | 100 | 1,400 | 0 | 100 | 1,400 | 0 | 100 |
| Map critical habitat | 1,000 | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Undertake hydrological threat analysis | 4,500 | 0 | 2,500 | 3,500 | 0 | 0 | 3,500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Develop and implement a fire management strategy | 1400 | 0 | 1200 | 200 | 0 | 800 | 200 | 0 | 800 | 200 | 0 | 800 | 200 | 0 | 800 |
| Stimulate the germination of soil-stored seed | 2500 | 0 | 1900 | 2500 | 0 | 1900 | 200 | 0 | 800 | 200 | 0 | 800 | 200 | 0 | 800 |
| Start the translocation process | 0 | 0 | 0 | 0 | 0 | 0 | 2400 | 0 | 3100 | 0 | 0 | 0 | 2000 | 0 | 2000 |
| Conduct further surveys | 1000 | 500 | 1500 | 1000 | 500 | 1500 | 1000 | 500 | 1500 | 1000 | 500 | 1500 | 1000 | 500 | 1500 |
| Monitor populations | 1000 | 0 | 1500 | 1000 | 0 | 1500 | 1000 | 0 | 1500 | 1000 | 0 | 1500 | 1000 | 0 | 1500 |
| Collect seed and cutting material | 400 | 200 | 400 | 400 | 200 | 400 | 400 | 200 | 400 | 400 | 200 | 400 | 400 | 200 | 400 |
| Undertake weed control | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 |
| Liaise with land managers | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 | 500 | 0 | 300 |
| Promote awareness | 1200 | 0 | 700 | 1200 | 0 | 0 | 900 | 0 | 0 | 900 | 0 | 0 | 900 | 0 | 0 |
| Obtain biological and ecological information | 8900 | 0 | 12000 | 8900 | 0 | 12000 | 8900 | 0 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 |
| Review this IRP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11200 | 0 | 9100 |
| | | | | | | | | | | | | | | | |
| Total | 24,300 | 700 | 22,900 | 21,100 | 700 | 18800 | 20,900 | 700 | 20,800 | 6,100 | 700 | 5,700 | 19,300 | 700 | 16,800 |
| Yearly Total | | 47,900 | | | 40,600 | | | 42,400 | | | 12,500 | | | 36,800 | |

Ext. = External funding (funding to be sought), Other = funds contributed by NHT, in-kind contribution and BGPA.

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| Total CALM: | \$91,700 |
| Total Other: | \$3,500 |
| Total Ext: | \$85,000 |
| Total costs: | \$180,200 |

