IRONSTONE PETROPHILE

(*PETROPHILE LATERICOLA* MS)

INTERIM RECOVERY PLAN

2001-2004

Robyn Phillimore, Meredith Soutar and Val English

Photo Andrew Brown

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Department of Conservation and Land Management
Western Australian Threatened Species and Communities Unit (WATSCU)
PO Box 51, Wanneroo, WA 6946

Government of Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

Natural Heritage Trust
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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This Interim Recovery Plan will operate from March 2001 to February 2004 but will remain in force until withdrawn or replaced.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 three years.

This IRP was approved by the Director of Nature Conservation on 26 June 2001. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at March 2001.

SUMMARY

Scientific Name:	*Petrophile latericola* ms	**Common Name:**	Ironstone petrophile
Family:	Proteaceae	**Flowering Period:**	October to November
CALM Region:	Central Forest	**CALM District:**	South West Capes
Shire:	Busselton	**Recovery Team:**	Central Forest Region Threatened Flora and Communities Recovery Team (CFRTFCRT)

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

Current status: *Petrophile latericola* ms was declared as Rare Flora in October 1996 and was ranked in September 1997 as Critically Endangered (CR). It currently meets World Conservation Union (IUCN) Red List Category 'CR' under criteria A2c and C1 (IUCN 2000) due to low numbers of plants and a continued decline in the area and quality of habitat. The main threats are road, rail and firebreak maintenance activities, disease, weeds, hydrological changes, inappropriate fire regimes, drainage channel maintenance, and competition.

Critical habitat: The critical habitat for *Petrophile latericola* ms comprises the area of occupancy of the known populations; areas of tall and low heath in shallow red/brown sandy-clay soil over ironstone in winter wet flats, as well as areas of Ironstone with remnant vegetation within 200 metres of the known populations; the local catchment for the surface and groundwater that provides the wetland habitat of the species; corridors of remnant vegetation that link populations; additional occurrences of the ecological community 'Shrubland Association on Southern Swan Coastal Plain Ironstone' and tall and low heath in shallow red sandy-clay soil over ironstone in winter wet flats, that do not currently contain the species.

Habitat requirements: *Petrophile latericola* ms is endemic to Western Australia and is apparently confined to the south-west of Busselton in the Whicher Range. It inhabits tall and low heath on shallow red/brown sandy-clay soil over ironstone in winter wet flats with swamp teatree (*Pericalymma ellipticum*) and fringed regelia (*Regelia ciliata*).

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

1. Most relevant people have been made aware of the existence of this taxon and its locations. These notifications detailed the Declared Rare status of the taxon and the associated legal responsibilities.
2. There are continuing negotiations to alter the care, control and management of land on which Populations 1 and 3 occur from rail reserve to conservation reserve.
3. Declared Rare Flora (DRF) markers have been installed at Subpopulations 1b, 2b and 3.
4. Dashboard stickers and posters have been produced and distributed. These illustrate DRF markers, inform of their purpose and provide a contact telephone number to use if such a marker is encountered.
5. CALM's South West Capes District have developed maps and informed flora pickers that the area in which *Petrophile latericola* ms occurs is not available for commercial wildflower picking.
6. Seed from *Petrophile latericola* ms is stored in CALM's Threatened Flora Seed Centre (TFSC).
7. The BGPA currently have 100 *Petrophile latericola* ms plants cultivated from seed and cuttings.
8. Areas of the ironstone community that contain *Petrophile latericola* ms have been sprayed with phosphite to control the plant pathogen *Phytophthora cinnamomi*.
9. In 1999 bollards were installed across the access track to prevent vehicular access to Population 2a.
10. A small barrier has been placed adjacent to the vegetation at Subpopulation 3 to prevent accidental damage.
11. The known populations of *Petrophile latericola* ms were surveyed and boundaries mapped in 1999.
12. Three areas of the 'Shrubland Association on Southern Swan Coastal Plain Ironstone' have been purchased, and two of these are being used as translocation sites for ironstone taxa.
13. The Central Forest Region Threatened Flora and Communities Recovery Team (CFRTFCRT) is overseeing the implementation of this IRP and will include information on progress in its annual report to CALM's Corporate Executive and funding bodies.
14. Staff from CALM's South West Capes District Office regularly monitor the populations.

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. Coordinate recovery actions.
2. Apply phosphite.
3. Monitor the impact of phosphite application.
4. Implement disease hygiene measures.
5. Develop and implement a drainage management strategy.
6. Install Declared Rare Flora markers.
7. Propagate plants for translocation.
8. Undertake and monitor translocation.
9. Undertake weed control.
10. Develop and implement a fire management strategy.
11. Monitor populations.
12. Collect seed.
13. Notify and liaise with relevant land managers.
14. Alter care control and management of habitat of Population 2.
15. Negotiate to acquire land that contains Populations 1 and 3.
16. Obtain biological and ecological information.
17. Promote awareness.
18. Write a full Recovery Plan.

1. BACKGROUND

History

A single specimen of *Petrophile latericola* ms was discovered by G Keighery[1] in 1991 on a rail reserve (Population 1a) during a floristic survey of the southern Swan Coastal Plain (Gibson *et al*. 1994). Soon after this during the same survey, a further population consisting of 287 plants (Populations 2a and 2b) was located in nearby State Forest. CALM District staff have since located additional plants (Populations 1b and 3) in remnant vegetation that adjoins Population 1a.

In 1992 the rail reserve populations (Populations 1 and 3) were burnt and it was not until 1997 that some plants were relocated in the populations by CALM District staff. A hot fire also burnt through part of Subpopulation 2a in 1992 and resulted in the death of some mature individuals. Some regeneration has since occurred. Currently the species is known from three populations consisting of around 200 plants.

Description

Petrophile latericola ms is an upright, single-stemmed, open shrub, from 0.4 m to 1.5 m high and about 0.40 m wide with few branches. The hard, linear leaves are 15 to 50 mm long, circular in cross-section, end in a rigid, sharp point, and are held erect and close to the stem. The species has small, rounded inflorescences at the ends of the branchlets, with numerous overlapping brown bracts at their base. The flowers are bright yellow, hairy, and are about 20 mm long. The pollen presenter is erect and yellow, 3 to 5 mm long and has a hairy brush near the tip. The fruiting heads are rounded and up to 20 mm long (Brown *et al*., 1998).

Petrophile latericola ms differs from *P. brevifolia* in having longer, spreading leaves and having more flowers on inflorescences (Brown *et al*. 1998).

Distribution and habitat

Petrophile latericola ms is endemic to Western Australia and is apparently confined to the south-west of Busselton. It inhabits tall and low heath on shallow red/brown sandy-clay soil over ironstone in winter wet flats with swamp teatree (*Pericalymma ellipticum*) and fringed regelia (*Regelia ciliata*) (Brown *et al*. 1998). The populations of *Petrophile latericola* ms occur with a number of other Declared Rare Flora species, within a Critically Endangered threatened ecological community (TEC). Dieback disease caused by the plant pathogen *Phytophthora cinnamomi* (Pc) is known to occur within these occurrences of the TEC. This assemblage occurs on ironstone soils that are highly restricted in distribution. The sites in which this taxon occurs are two of 13 occurrences of this species-rich plant community located on seasonal wetlands on ironstone and heavy clay soils on the Swan Coastal Plain near Busselton (English 1999). Associated species include *Hakea varia*, *Loxocarya magna* and *Chamelaucium roycei*. Much of the species diversity in the community comes from annuals and geophytes. Typical and common native species are the shrubs *Kunzea micrantha*, *Hakea oldfieldii*, *Hemiandra pungens* and *Viminaria juncea*, and the herbs *Aphelia cyperoides* and *Centrolepis aristata* (Gibson *et al*. 1994).

There are six additional Declared Rare Flora (DRF), three of which are ranked Critically Endangered, that occur on the ironstone soils in the vicinity of *Petrophile latericola* ms. DRF and Priority flora that occur with *P. latericola* ms are outlined in the table below.

[1] Greg Keighery, Principal Research Scientist, CALMScience

DRF and Priority flora found near *Petrophile latericola* ms
(Source: Western Australian Herbarium, 2000)

SPECIES	STATUS	RANK
Andersonia ferricola ms	Priority	1
Schoenus pennisetis	Priority	1
Hakea oldfieldii	Priority	3
Isopogon formosus subsp. *dasylepis*	Priority	3
Stylidium mimeticum	Priority	3
Synaphea whicherensis	Priority	3
Darwinia sp. Williamson	DRF	Critically endangered
Lambertia echinata subsp. *occidentalis*	DRF	Critically endangered
Brachysema papilio	DRF	Critically endangered
Dryandra nivea subsp. *uliginosa*	DRF	Endangered
Dryandra squarrosa subsp. *argillacea*	DRF	Endangered
Chamelaucium roycei ms	DRF	Vulnerable

This IRP will be implemented in conjunction with the IRP for the "Shrubland Association on Southern Swan Coastal Plain Ironstone Community" (English 1999) and the IRPs for *Darwinia* sp. Williamson (Stack, *et al*. 1999a), *Lambertia echinata* subsp. *occidentalis* (Stack *et al*. 1999b) and *Brachysema papilio* (Phillimore *et al*. in prep).

Critical habitat

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

The critical habitat for *Petrophile latericola* ms comprises:

- the area of occupancy of the known populations,
- areas of similar habitat ie. tall and low heath in shallow red/brown sandy-clay soil over ironstone in winter wet flats, as well as areas of Ironstone soils with remnant vegetation, within 200 metres of the known populations (these provide potential habitat for natural range extension),
- the local catchment for the surface and groundwater that provides the wetland habitat of the species (the species occurs in winter wet areas and is dependent on maintenance of local hydrology),
- corridors of remnant vegetation that link populations (these are necessary to allow pollinators to move between populations and are usually road and rail verges),
- additional occurrences of the ecological community 'Shrubland Association on Southern Swan Coastal Plain Ironstone' that do not currently contain the species (these represent possible translocation sites).

Biology and ecology

Monitoring of *Petrophile latericola* ms after the fire in 1992 suggests that adult plants are killed by hot fire, with some recruitment occurring from seed. Plants at Subpopulation 2a which was burnt in 1992 are healthy and vigorous compared to the hard, woody plants in Subpopulation 2b, which is long unburnt. This suggests that occasional fire may be beneficial to the reproduction of the species. Fire is likely to be detrimental to the species, however, if the populations are burnt again before seedlings or juvenile plants have a chance to reach maturity.

Testing of the species' susceptibility to *Phytophthora cinnamomi* by CALMScience has so far been inconclusive. Testing was attempted on three *Petrophile latericola* ms plants, however, two died before they could be inoculated with the fungus. The third plant has yet to be tested for susceptibility (pers comm., C. Crane[2]). Further investigation on dieback susceptibility is required and will be addressed under Recovery Action 17.

[2] Colin Crane, Senior Technical Officer, CALMScience

Threats

Petrophile latericola ms was declared as Rare Flora in October 1996 and ranked in September 1997 as Critically Endangered (CR). It currently meets World Conservation Union (IUCN) Red List Category 'CR' under criteria A2c, C1 (IUCN 2000) due to low numbers of plants and a continued decline in the area and quality of habitat. The main threats are road, rail and firebreak maintenance activities, disease, weeds, hydrological changes, inappropriate fire regimes, drainage channel maintenance and competition.

- **Road, rail and firebreak maintenance activities** threaten *Petrophile latericola* ms and its habitat. Threats include actions such as grading road reserves, chemical weed control, and maintenance of drainage. These disturbance events also often encourage weed invasion into adjacent habitat, as well as causing damage to actual plants. Relevant authorities need to be informed of the location of populations so that appropriate protective measures can be implemented. Adjacent landowners should also be informed of the locations to prevent possible damage due to grazing, crop maintenance, firebreak maintenance or other activities that may threaten the populations.

- **Disease** threatens all *Petrophile latericola* ms populations. It is not known whether *P. latericola* ms is susceptible to *Phytophthora* species. However, there have been deaths of the DRF species *Dryandra nivea* subsp. *uliginosa* in the habitat of *Petrophile latericola* ms. Canker (probably *Armillaria luteobubalina*) is also present in the habitat of Subpopulation 2a.

- **Weed invasion** is a threat to the 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.

- **Hydrological changes** may in future become threats to the populations (Tille and Lantzke 1990). Extensive clearing for agriculture in the area is likely to have increased surface runoff and recharge of the groundwater. Waterlogging and salinity will require monitoring. Hirschberg (1989) measured levels of salinity in the groundwater in the South West Capes area, and found the water near the populations ranged between 200-400 per litre total dissolved solids, which is reasonably fresh. Conversely, the habitat appears to be drought prone during summer months (Brown *et al*. 1998). Adjacent developments, including mining, also have the potential to alter hydrological processes and threaten the populations.

- **Inappropriate fire regimes** would affect the viability of the populations, as *Petrophile latericola* ms appears to germinate from seed following fire. Therefore the soil seed bank would rapidly be depleted if fires recurred before regenerating or juvenile plants reached maturity and replenished the soil seed bank. However, it is likely that occasional fires are required for reproduction of the species.

- **Drainage channel maintenance** may threaten the habitat near Subpopulation 1b. A Water Corporation Drain Reserve including a drainage channel and its maintenance track run parallel to the road reserve that contains *Petrophile latericola* ms. During maintenance scouring of the channel to alleviate flooding of agricultural lands, and the existing road, removed soil is mounded upon the maintenance track. This disturbs vegetation and exacerbates weed invasion into the narrow road reserve. Initial consultations indicate it may be possible to have the maintenance track established on the northern side of the drainage channel between the channel and private property fence, thereby effectively increasing the vegetated width of the road reserve.

- **Competition** from local dodder and reed species is a threat to Population 3, as they cover some adult plants. Dodder not only competes for light, nutrients and possibly pollinators but also physically restricts the host, therefore posing a threat to individual plants.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1A. ESE Busselton	Rail Reserve	1991 1 1992 0 1996 0 2000 0	Poor	Weeds, firebreak maintenance, hydrological changes, disease, inappropriate fire regimes
1B. ESE Busselton	Shire Road Reserve	2000 2	Healthy	Weeds, disease, road and drainage maintenance, inappropriate fire regimes, hydrological changes
2A. ESE Busselton	State Forest	1992 137 1996 100+ 2000 100+	Healthy	Hydrological changes, disease, inappropriate fire regimes
2B. ESE Busselton	State Forest	1992 150 1996 100+ 2000 100+	Healthy	Hydrological changes, disease, inappropriate fire regimes
3. ESE Busselton	Rail Reserve	1991 1 1992 0 1996 0 1997 3 1999 4 2000 6	Poor	Weeds, competition, firebreak maintenance, hydrological changes, disease, inappropriate fire regimes

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of any of the populations or within the defined critical habitat of *Petrophile latericola* ms require assessment. No developments should be approved unless the proponents can demonstrate that they will have no significant impact on the species, its habitat or potential habitat, the local hydrology, and that the proposal does not have the potential to spread or amplify dieback disease caused by the plant pathogen *Phytophthora cinnamomi*.

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

Relevant people have been made aware of the existence of this taxon and its locations. Westrail and private property owners have been formally notified of the presence of the *Petrophile latericola* ms populations on their lands. These notifications detailed the Declared Rare status of the taxon and the associated legal responsibilities. The mining company with a tenement over an area containing Population 2 was notified of the presence of the species in June 1999. A Notice of Intent to mine the private property adjacent to Population 2 was issued in November 2000. CALM will liaise with both the proponent and the Department of Environmental Protection (DEP) regarding State environmental assessment of the proposal. It is anticipated the proposal will also be assessed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999.

Negotiations to alter the care, control and management of the land on which Population 1 and 3 occur from rail reserve to a Class A Nature Reserve vested in the Conservation Commission continue.

Declared Rare Flora (DRF) markers have been installed at Subpopulations 1b, 2b and 3. These alert people working in the area to the presence of significant flora and communities and help prevent accidental damage

during maintenance operations. Awareness of the significance of these markers is being promoted to relevant bodies such as shires. To this end, dashboard stickers and posters have been produced and distributed. These illustrate DRF markers, inform of their purpose and provide a contact telephone number to use if such a marker is encountered.

CALM's South West Capes District have informed pickers and provided maps that indicate the area in which *Petrophile latericola* ms occurs is an exclusion zone not available for commercial wildflower picking. This will help to ensure that pickers do not enter the areas.

Approximately 615 seeds were collected from Population 2 in March and December 1994 and stored in CALM's TFSC at -18°C. The TFSC test the viability of the seed initially and after one year in storage. The initial germination rate of *Petrophile latericola* ms seed was found to be 6%, and after one year in storage was 11%. In December 1995, 453 seeds which had an initial germination rate of 8% and 33% were collected from Population 2. After one year in storage the germination rate was 67% and 70%. Other collections have been made from Population 2. 420 seeds were collected in February 1997, and 486 seeds in January and February 1998. The germination rate was 0%, 11% and 40% respectively, and after one year was 97%, 11% and 72% respectively (unpublished data, A. Cochrane[3]).

Cuttings from Population 2 were forwarded to BGPA in 2000 for propagation. Further seed will be collected and propagated for a proposed translocation of the species in 2001.

The BGPA currently have 100 *Petrophile latericola* ms plants in cultivation, and these represent 15 clones. 62 of these plants are in pots in the nursery, and 38 are in the Botanic Gardens. This material has been propagated from seed and cutting material taken since 1992. The species grows quite well from cuttings, with results ranging from 10% to 100% success (pers comm., A. Shade[4]).

Experimental application of phosphite to the TEC that contains *Petrophile latericola* ms commenced in 1996. A 4.2 hectare area of the ironstone community that contains Population 2 of *Petrophile latericola* ms was sprayed three times in May, June and again in spring 1996. Follow-up spraying occurred in April and December 1998, and May 2000. A seven hectare area that contains Populations 1 and 3 was also sprayed twice with phosphite in May 2000. The spread and impact of the disease are being monitored. CALM staff are assessing the effectiveness of this treatment by monitoring the local key dieback indicator species; *Lambertia echinata* subsp. *occidentalis* and *Dryandra nivea* subsp. *uliginosa* (pers comm., R. Smith[5]) at Subpopulations 2a and 2b, and *Dryandra squarossa* subsp. *argillacea* at Populations 1 and 3.

Bollards were installed across the access track in 1999 to prevent vehicular access to the area that contains Subpopulation 2a of *Petrophile latericola* ms.

A small barrier was placed parallel to the fenceline and adjacent to the vegetation at Population 3 to prevent accidental damage to the plants.

The known populations of *Petrophile latericola* ms were surveyed and boundaries mapped with a differential GPS in 1999. This information is stored in the District Geographic Information System database.

A total of three occurrences of the 'Shrubland Association on Southern Swan Coastal Plain Ironstone' encompassing an area of approximately 42 hectares have been purchased. Translocations of two ironstone species to two of these sites were undertaken in 2000. It is also intended that the same sites be used for a translocation of *Petrophile latericola* ms in 2001.

The Central Forest Region Threatened Flora and Communities Recovery Team (CFRTFCRT) is overseeing the implementation of this IRP and will include it in its annual report to CALM's Corporate Executive and funding bodies.

Staff from CALM's South West Capes District Office regularly monitor the populations.

Future recovery actions

[3] Anne Cochrane, Manager, CALM Threatened Flora Seed Centre
[4] Amanda Shade, Horticulturalist, Botanic Garden and Parks Authority
[5] Russell Smith, Ecologist, Phosphite Program, CALM Bunbury

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

1. Coordinate recovery actions

The CFRTFCRT will continue to oversee the implementation of recovery actions for *Petrophile latericola* ms and will include information on progress in its annual report to CALM's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: CALM (Central Forest Region) through the CFRTFCRT
Cost: $700 per year

2. Apply phosphite

The populations of *Petrophile latericola* ms occur with a number of other Declared Rare Flora, in occurrences of a TEC. CALM will continue applying phosphite to the areas of the TEC in which *Petrophile latericola* ms occurs. This will have the added benefit of protecting a number of other threatened plant species in the area and will help conserve the community as a whole.

Action: Apply phosphite
Responsibility: CALM (South West Capes District, Dieback Disease Coordinator) through the CFRTFCRT
Cost: $4,000 per year

3. Monitor the impact of phosphite application

The impact of the application of phosphite on *P. latericola* ms and in the control of *Phytophthora cinnamomi* will be monitored.

Action: Monitor the impact of phosphite application
Responsibility: CALM (South West Capes District, Dieback Disease Coordinator) through the CFRTFCRT
Cost: $600 per year

4. Implement disease hygiene measures

It is necessary to maintain disease hygiene measures, to reduce the likelihood of introducing or amplifying the impacts of the disease in the habitat of *P. latericola* ms. Access to the area will be restricted, especially when the soil is moist. Signs advising of the dieback risk will be posted at the populations.

Action: Implement disease hygiene measures
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $1,500 in the first year

5. Develop and implement a drainage management strategy

A drainage control and rehabilitation strategy will be developed for the habitat of Subpopulation 1b and implemented in liaison with relevant stakeholders including the Water Corporation and local Shire. Such a strategy may include the establishment of a drain maintenance track north of the drainage channel between the channel and private property fence to allow the existing track to revegetate. This would increase the width of potential habitat for *Petrophile latericola* ms and reduce the risk of disturbance and weed invasion during future drain maintenance activities.

Action: Develop and implement a drainage management strategy at Subpopulation 1b
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: To be determined

6. Install Declared Rare Flora markers

Declared Rare Flora (DRF) markers are required on the firebreak near Population 3. Their purpose is to alert people operating in the area to the presence of DRF and help prevent accidental damage during maintenance operations.

Action: Install DRF markers
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $500 in first year

7. Propagate plants for translocation

The propagation of plants in readiness for translocation is essential as the only known wild populations of *Petrophile latericola* ms are under serious threat. Seed and/or cuttings will be taken for germination and propagation by the BGPA for use in translocations.

Action: Propagate plants for translocation
Responsibility: CALM (South West Capes District) and the BGPA through the CFRTFCRT
Cost: $2,800 in first and second years

8. Undertake and monitor translocation

Although translocations are generally undertaken under full Recovery Plans, the many threats to the wild populations of this species is indicative of the need for development of a translocation proposal within the time frame of this IRP. This will be coordinated by the CFRTFCRT. Information on the translocation of threatened animals and plants in the wild is provided in CALM Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. All translocation proposals require endorsement by the Director of Nature Conservation.

Petrophile latericola ms will be translocated into two sites into which the critically endangered taxa *Grevillea maccutcheonii* and *Lambertia echinata* subsp. *occidentalis* have already been planted. The sites contain a similar soil type, associated vegetation and structure to that of the habitat of the known populations. Monitoring of the translocation is essential and will be undertaken according to the timetable to be set out in the Translocation Proposal.

Action: Undertake and monitor translocation
Responsibility: CALM (CALMScience, South West Capes District) through the CFRTFCRT
Cost: $13,600 in first year, and $5,000 in subsequent years

9. Undertake weed control

Weeds are a threat to Populations 1 and 3, in particular, and the following actions will be implemented:

1. Selection of appropriate herbicides after determining which weeds are present.
2. Controlling invasive weeds by hand removal or spot spraying around *Petrophile latericola* ms plants when weeds first emerge.
3. Scheduling weed control to include spraying at other threatened flora populations within the district.

The tolerance of associated native plant species to herbicides at the site of *Petrophile latericola* ms is not known and weed control programs will be undertaken in conjunction with research.

Action: Undertake weed control
Responsibility: CALM (South West Capes District, CALMScience) through the CFRTFCRT
Cost: $500 per year

10. Develop and implement a fire management strategy

Fire appears to kill adult plants of the species, and regeneration appears to be largely from seed. Frequent fire may prevent the accumulation of sufficient soil stored seed to allow regeneration of the populations. Fire should therefore be prevented from occurring in the areas that contain the populations at least in the short term. A fire management strategy will be developed that describes fire control measures, timing and fire frequency.

Action: Develop and implement a fire management strategy
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $2,300 in first year and $1,000 in subsequent years

11. Monitor populations

Annual monitoring of factors such as habitat degradation (including the impact of Pc), population stability (expansion or decline), weed invasion, regeneration, competition, pollination activity, seed production, recruitment, longevity and predation is essential. Salinity and groundwater levels, and depth and timing of inundation in the habitat will be monitored as part of the implementation of the recovery actions outlined in the IRP for the community 'Shrublands on southern Swan Coastal Plain Ironstones' (English 1999).

Action: Monitor populations
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $1,200 per year

12. Collect seed

Preservation of germplasm is essential to guard against extinction if wild populations are lost. Seed collections are also needed to propagate plants for translocations. A small quantity of seed has been collected from Population 2 but additional seed is required, particularly as that collected appears to have low germination levels. Cuttings have been collected to establish a living collection of genetic material at the BGPA.

Action: Collect seed
Responsibility: CALM (South West Capes District, TFSC) through the CFRTFCRT
Cost: $2,500 in first and second years.

13. Notify and liaise with relevant land managers

Managers of land adjacent to all populations, including the Shire and Water Corporation, will be officially notified of the presence of *Petrophile latericola* ms. Staff from CALM's South West Capes District will continue to liaise with managers of land on which the populations occur, and managers of adjacent lands, to ensure the populations are not damaged or accidentally destroyed. Due to the potential susceptibility of the habitat of this species to dieback caused by *Phytophthora* spp., the need for the application of dieback hygiene procedures will be included in information provided to land managers. This will stress the need to restrict the movement of soil into the habitat of the populations.

A Notice of Intent to mine on the private property adjacent to Population 2 was issued in November 2000. CALM will liaise with both the proponent and the DEP regarding environmental assessment of the proposal. It is anticipated the proposal will also be assessed under the Commonwealth EPBC Act 1999.

Action: Notify and liaise with relevant land managers
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $1,700 in first year and $1,100 in subsequent years

14. Alter care control and management of habitat of Population 2

Negotiations will continue to place the care control and management of the area of State Forest that contains Population 2 of *Petrophile latericola* ms with the Conservation Commission as Class A reserve for the purpose of Conservation of Flora and Fauna.

Action: Alter care control and management
Responsibility: CALM (South West Capes District) through the CFRTFCRT
Cost: $500 in first and second years

15. Negotiate to acquire land that contains Populations 1 and 3

CALM will continue to negotiate to have the care, control and management of the road and rail reserves that contain Populations 1 and 3 placed with the Conservation Commission as Class A reserve for the purpose of 'Conservation of Flora and Fauna'.

Action: Negotiate to acquire land
Responsibility: CALM (South West Capes District) through the CFRTFRT
Cost: To be determined

16. Obtain biological and ecological information

Increased knowledge of the biology and ecology of the species will provide a scientific basis for management of *Petrophile latericola* ms in the wild. Investigations will include:

1. Investigation of the impacts of dieback disease and control techniques on *Petrophile latericola* ms and its habitat.
2. Study of the soil seed bank dynamics and the role of various factors including disturbance (such as fire), competition, rainfall, and grazing in recruitment and seedling survival.
3. Determination of reproductive strategies, phenology and seasonal growth.
4. Investigation of the mating system and pollination biology.
5. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, South West Capes District) through the CFRTFCRT
Cost: $19,200 per year

17. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Petrophile latericola* ms will be promoted to the public. Awareness will be encouraged in the community by a publicity campaign 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 that includes a description of the plant, its habitat type, threats, management actions and photos will be produced.

Due to the potential susceptibility of the habitat of this species to dieback caused by *Phytophthora* spp., the need for the application of dieback hygiene procedures will be included in information provided to visitors to the habitat of the species. This will stress the need to restrict the movement of soil into the habitat of the populations.

Action: Promote awareness
Responsibility: CALM (South West Capes District, Corporate Relations) through the CFRTFCRT
Cost: $1,200 in first year and $800 in subsequent years

18. Write a full Recovery Plan

At the end of the second year of this Interim Recovery Plan, the need for further recovery will be assessed. If the species is still ranked Critically Endangered, a full Recovery Plan will be developed to describe actions required for long-term maintenance. A Recovery Plan will be prepared with the benefit of knowledge gained over the time frame of this Interim Recovery Plan.

Action: Write a full Recovery Plan
Responsibility: CALM (WATSCU, South West Capes District) through the CFRTFCRT
Cost: $20,700 in third year

4. TERM OF PLAN

This Interim Recovery Plan will operate from March 2001 to February 2004 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 three years.

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