INTERIM RECOVERY PLAN NO. 120

LARGE FLOWERED SHORT-STYLED GREVILLEA

(*GREVILLEA BRACHYSTYLIS* SUBSP. *GRANDIS* MS)

INTERIM RECOVERY PLAN 2002-2007

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Photo: Andrew Brown

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Natural Heritage Trust
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DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

FOREWORD

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

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

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

This Interim Recovery Plan will operate from October 2002 to September 2007 but will remain in force until withdrawn or replaced.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 reviewed after five years and the need for a full Recovery Plan assessed.

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

Information in this IRP was accurate at October 2002.

SUMMARY

Scientific Name:	*Grevillea brachystylis* subsp. *grandis* ms	**Common Name:**	Large flowered short-styled grevillea
Family:	Proteaceae	**Flowering Period:**	June to December
Dept Region:	South West	**Dept District:**	Blackwood
Shire:	Busselton	**Recovery Team:**	South West Region Threatened Flora Recovery Team

Illustrations and/or further information: G. Keighery (in draft) Taxonomic Notes on the Proteaceae of the Swan Coastal Plain.

Current status: *Grevillea brachystylis* subsp. *grandis* ms was declared as Rare Flora in April 2002. It currently meets World Conservation Union (IUCN, 2000) Red List Category 'CR' under criteria A4c and B1ab(iii)+2ab(iii) due to the severe fragmentation of populations and continuing decline in the quality of habitat. The main threats are competition from weeds, maintenance of roads, drains and firebreaks, and inappropriate fire regimes.

Critical habitat: The critical habitat for *Grevillea brachystylis* subsp. *grandis* ms 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 taxon but may have done so in the past and may be used for translocations.

Habitat requirements: *Grevillea brachystylis* subsp. *grandis* ms is currently known from a range of less than 10 km^2 in an area south of Busselton. It grows on brown lateritic clay loam soils in marri woodland (Keighery, in draft), in areas infested with **Watsonia bulbillifera* and **Juncus microcephalus.*

Existing Recovery Actions: The following recovery actions have been or are currently being implemented:
1. Land managers have been made aware of the location and threatened status of the taxon.
2. Declared Rare Flora markers have been installed at all roadside populations.
3. Staff from the Department's Blackwood District regularly monitor populations of the taxon.
4. Staff from the Department's Blackwood District are overseeing the implementation of this IRP and will include information on progress to the Department's Corporate Executive and funding bodies.

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 subspecies 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. Undertake weed control
3. Collect seed and cutting material
4. Conduct further surveys
5. Develop and implement a fire management strategy
6. Seek improved security for populations
8. Monitor populations
9. Stimulate germination of soil-stored seed
10. Obtain biological and ecological information
11. Promote awareness
12. Start translocation process
13. Review the need for a full Recovery Plan

1. BACKGROUND

History

G. Keighery[1] made the first collection of *Grevillea brachystylis* subsp. *grandis* ms from an area south of Busselton in 1985. Although this population has now been cleared, a further two populations containing a total of approximately 160 mature plants have been found in the vicinity. Most of these plants occur on road verges, and the remainder on private property. The taxon's preferred habitat type has been extensively cleared for agriculture as it occurs on fertile soils.

Description

Grevillea brachystylis subsp. *grandis* ms differs from *Grevillea brachystylis* subsp. *brachystylis* in being erect to 2 m tall, normally less, with 1 to 3 stems per plant which are much more robust than the type form. Flowers, pedicels and leaves are much larger in all measurements. For example, leaves of *Grevillea brachystylis* subsp. *grandis* ms are up to 102 mm long and 12 mm wide, compared to those of *Grevillea brachystylis* subsp. *brachystylis* which are up to 52 mm long and 5 mm wide (Keighery, in draft).

Distribution and habitat

Grevillea brachystylis subsp. *grandis* ms is currently known from a narrow geographic range of less than 10 km at the base of the Whicher Scarp, where it grows on brown lateritic clay loam soils in marri woodland, in areas infested with the weeds **Watsonia bulbillifera* and **Juncus microcephalus* (Keighery, in draft).

Critical habitat

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

The critical habitat for *Grevillea brachystylis* subsp. *grandis* ms comprises:

- the area of occupancy of known populations;
- areas of similar habitat within 200 metres of known populations, i.e. brown lateritic clay loam soils in marri woodland (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); and
- additional occurrences of similar habitat that do not currently contain the taxon but may have done so in the past (these represent possible translocation sites).

Biology and ecology

Grevillea brachystylis subsp. *grandis* ms appears to regenerate from seed following fires (Keighery, in draft). At Population 2 it was observed to have regenerated from seed or rootstock following roadside grading, and has survived the disturbance.

Threats

Grevillea brachystylis subsp. *grandis* ms was declared as Rare Flora in April 2002. It currently meets World Conservation Union (IUCN, 2000) Red List Category 'CR' under criteria A4c, and B1ab(iii)+2ab(iii) due to the severe fragmentation of populations and continuing decline in the quality of habitat. The main threats are weed competition, road, drain and firebreak maintenance, and inappropriate fire regimes.

[1] Greg Keighery, Principal Research Scientist, the Department's Wildlife Research Centre

- **Weed competition** is a major threat to all populations, particularly **Watsonia bulbillifera* and **Juncus microcephalus*. Weeds suppress early plant growth by competing for soil moisture, nutrients and light. They also exacerbate grazing pressure and increase the fire hazard due to the easy ignition of high fuel loads, which are produced annually by many weed species.

- **Road, drain and firebreak maintenance** threaten all populations. Threats include grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion.

- **Inappropriate fire regimes** may affect the viability of populations as *Grevillea brachystylis* subsp. *grandis* ms appears to regenerate from seed after fire. If this is the case, 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 needed for reproduction of this species.

Summary of population information and threats

Pop. No. & Location	Land Status	Year / No. plants	Condition	Threats
1. SE of Busselton	Shire Road Reserve	1985 1 2000 0	Cleared	Road maintenance, weed competition, inappropriate fire
2. SE of Busselton	Shire Road Reserve	2000 64 (90)	Healthy but Disturbed	Weed competition, road & drain maintenance, inappropriate fire
3a. SE of Busselton	Shire Road Reserve	2001 70	Healthy but Disturbed	Road maintenance, weed competition, inappropriate fire
3b. SE of Busselton	Private Property	2001 25	Healthy but Disturbed	Firebreak maintenance, inappropriate fire
4. SE of Busselton	Shire Road Reserve	2002 6-20	Healthy but Disturbed	Road maintenance, weed competition, inappropriate fire
5. SE of Busselton	Shire Road Reserve	2002 3	Healthy	Road maintenance, weed invasion, inappropriate fire

Numbers in brackets = number of seedlings.

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 *Grevillea brachystylis* subsp. *grandis* ms 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.

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

All land managers have been notified of the location and threatened status of *Grevillea brachystylis* subsp. *grandis* ms, and the associated legal responsibilities.

Declared Rare Flora (DRF) markers have been installed at all roadside populations. These serve to alert people working in the vicinity to the presence of DRF, and the need to avoid damage to the vegetation between the markers.

Staff from the Department's Blackwood District regularly monitor populations of this species.

The South West Region Threatened Flora Recovery Team (SWRTFRT) will be overseeing the implementation of this IRP and will include information on progress in its annual report to the Department's Corporate Executive and funding bodies.

Future recovery actions

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

1. Coordinate recovery actions

The South West Region Threatened Flora Recovery Team will coordinate recovery actions for *Grevillea brachystylis* subsp. *grandis* ms and other Declared Rare flora in the region. They will include information on progress in their annual report to the Department's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: The Department (Blackwood District) through the SWRTFRT
Cost: $400 per year

2. Undertake weed control

Weeds including **Watsonia bulbillifera* and **Juncus microcephalus* are a major threat to all populations. Weed control will be undertaken in consultation with the land managers. This will be by hand weeding or localised application of herbicide. All applications of weed control will be followed by a report on the method, timing and success of the treatment against weeds, and the effect on *Grevillea brachystylis* subsp. *grandis* ms and associated native plant species. It is anticipated that native species in the habitat will regenerate well after weed competition is removed.

Action: Undertake weed control
Responsibility: The Department (Blackwood District, Science Division) through the SWRTFRT
Cost: $1,000 per year

3. 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. Seed is required from all populations to maximise the genetic diversity of the *ex situ* material. Cuttings will also be obtained to establish a living collection at the Botanic Gardens and Parks Authority (BGPA).

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

4. Conduct further surveys

Community volunteers will be encouraged to be involved in further surveys supervised by Departmental staff. Surveys will be conducted during the taxon's flowering period (June to December).

Action: Conduct further surveys
Responsibility: The Department (Blackwood District) through the SWRTFRT
Cost: $1,000 per year

5. 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 will 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 (Blackwood District) through the SWRTFRT
Cost: $2,600 in first year and $1,000 in subsequent years

6. Seek improved security for populations

Staff from the Department's Blackwood District will continue to liaise with land managers and landowners to ensure that populations are not accidentally damaged or destroyed. In addition, ways and means of improving the security of populations and their habitat will be investigated. For Population 3b on private property, this may include conservation covenants with a range of agencies or the Land for Wildlife scheme.

Action: Seek improved security for populations
Responsibility: The Department (Blackwood District) through the SWRTFRT
Cost: $800 per year

7. Monitor populations

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

Action: Monitor populations
Responsibility: The Department (Blackwood District) through the SWRTFRT
Cost: $1,000 per year

8. 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 near existing populations in areas newly cleared of weeds, and/or in areas where *Grevillea brachystylis* subsp. *grandis* ms was known to occur previously.

Action: Stimulate the germination of soil-stored seed
Responsibility: The Department (Blackwood District) through the SWRTFRT
Cost: $4,400 in fourth and fifth years

9. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Grevillea brachystylis* subsp. *grandis* ms will provide a better scientific basis for management of the wild populations. An understanding of the following is particularly necessary for effective management:

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

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

10. Promote awareness

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

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

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

11. 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 SWRTFRT. 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 (Blackwood District, Science Division) through the SWRTFRT
Cost: $5,500 in the third year and $4,000 in the fifth year

12. Review the need for 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 the need for a full Recovery Plan or to update this IRP will be assessed.

Action: Review the need for a full Recovery Plan
Responsibility: The Department (WATSCU, Blackwood District) through the SWRTFRT
Cost: $20,300 in the fifth year (if required)

4. TERM OF PLAN

This Interim Recovery Plan will operate from October 2002 to September 2007 but will remain in force until withdrawn or replaced. If the taxon is still ranked Critically Endangered after five years, the need to update this IRP or to replace it with a full Recovery Plan will be determined.

5. ACKNOWLEDGMENTS

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

Anne Cochrane — Manager, the Department's Threatened Flora Seed Centre
Greg Keighery — Principal Research Scientist, the Department's Wildlife Research Centre
Meredith Spencer — Conservation Officer, the Department's Blackwood District

Thanks also to staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and the Department's Wildlife Branch for their assistance.

6. REFERENCES

Department of Conservation and Land Management (1992) Policy Statement No. 44 *Wildlife Management Programs*. Department of Conservation and Land Management, Western Australia.

Department of Conservation and Land Management (1994) Policy Statement No. 50 *Setting Priorities for the Conservation of Western Australia's Threatened Flora and Fauna*. Department of Conservation and Land Management, Western Australia.

Department of Conservation and Land Management (1995) Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. Department of Conservation and Land Management, Western Australia.

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

Keighery, G. (in draft) Taxonomic Notes on the Proteaceae of the Swan Coastal Plain. Department of Conservation and Land Management, Western Australia.

World Conservation Union (2000) *IUCN red list categories prepared by the IUCN Species Survival Commission*, *as approved by the 51st meeting of the IUCN Council*. Gland, Switzerland.

7. TAXONOMIC DESCRIPTION

(Keighery, in draft)

1: A new Subspecies of *Grevillea brachystylis*

The *Grevillea brachystylis* species complex has been studied by Keighery (in draft) who divided the species into two species and two subspecies. One species is confined to the Blackwood Plateau and the other is comprised of two subspecies on the Swan and Scott Coastal Plains.

Continuing studies of this complex has elucidated a third subspecies confined to the base of the Whicher Escarpment which forms the interface between the Blackwood Plateau and the Swan Coastal Plain. This rare form of *Grevillea brachystylis* differs from the type form of G. *brachystylis* in being erect to 2 metres tall, although normally less, with 1 - 3 stems per plant, which are much more robust than the type form. Flowers, pedicels and leaves are much larger, in all measurements (Table one).

Table one: Character States of the nominate and new subspecies

Character	subspecies *grandis* ms	subspecies *brachystylis*
Flower limb	11 mm	6 mm
Pedicel	6-8 mm	2-3 mm
Pollen presenter	5 mm	2 mm
Leaf length	102 mm	52 mm
Leaf width	12 mm	5 mm

This variant of *Grevillea brachystylis* with an erect habit and large flowers could be responsible for some of the confusion that has been expressed by certain taxonomists in differentiating between *Grevillea brachystylis* subsp. *brachystylis* (a Swan Coastal Plain endemic) and *Grevillea bronwenae* (a Blackwood Plateau endemic). Although it has an erect habit like *G. bronwenae* and larger flowers than the type form, the flowers are the same shape as normal *G. brachystylis* as illustrated in Keighery (in draft).

***Grevillea brachystylis* subsp. *grandis* ms** G.J. Keighery subspecies nov
Differt a Grevillea brachystylis ramis erecta,

Typus: Bodalin Road, 12 Km. SSE of Busselton, 28-Aug.-1985, G.J. Keighery s.n. (Holo: PERTH 1071904, Iso: CANB).

Other collections examined. Base of Whicher Scarp, 15 Km. SSE of Busselton, 05-Dec,-1992, G.J. Keighery 13150 (PERTH).

Ecology/conservation. This subspecies grows only in Marri or Mountain Marri woodland on brown lateritic clay loams along the base of the Whicher Range. This corresponds to the Abba fertile soils (Tille and Lantzke, 1990) that have been almost entirely cleared for agriculture. Only three populations of this subspecies are known, all occurring on narrow road verges. The subspecies appears to regenerate from seed following fires and is able to cope with considerable disturbance, unlike the type form.

Conservation Code. Critically Endangered. Known only from two roadside populations south-east of Busselton.

Notes. This is an attractive and easily grown member of the complex.