INTERIM RECOVERY PLAN NO. 39

DWARF SPIDER ORCHID

(*CALADENIA BRYCEANA SUBSP. BRYCEANA* MS)

INTERIM RECOVERY PLAN

1999-2002

by

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Photograph: S.D. Hopper

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Natural Heritage Trust
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Department of Conservation and Land Management

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This Interim Recovery Plan will operate from June 1999 to May 2002 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is no longer ranked as 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 1 September 1999. 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 June 1999.

SUMMARY

Scientific Name: ***Caladenia bryceana* subsp. *bryceana* ms**
Common Name: Dwarf Spider Orchid
Family: Orchidaceae
Flowering Period: August-mid September
CALM Region: South Coast and Central Forest
CALM District: Albany and Mornington
Shire: Jerramungup, Gnowangerup and West Arthur
Recovery Team: Albany District and Central Forest Region Threatened Flora Recovery Teams (ADTFRT, CFRTFRT)

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; Hoffman, N. and Brown, A. (1992) *Orchids of South West Australia.* 2nd Edition. University of Western Australia Press, Nedlands; Robinson C.J. and Coates D.J. (1995). *Declared Rare and Poorly Known Flora in the Albany District.* Department of Conservation and Land Management, Western Australia.

Current status: *Caladenia bryceana* subsp. *bryceana* ms was Declared as Rare Flora in March 1992 and ranked as Critically Endangered in September 1995. It currently meets World Conservation Union (IUCN) Red List Criteria C2a and B1+2c-e (IUCN 1994). The main threats are small population sizes, severe fragmentation, limited habitat and a continuing decline in quality of habitat, number of subpopulations and mature individuals. The subspecies is known from seven populations over a range of approximately 190 km between Boyup Brook and Boxwood Hills.

Habitat requirements: Habitat varies over the range of the subspecies and includes *Eucalyptus wandoo* over *Allocasuarina huegeliana, Eucalyptus rudis* over *Acacia acuminata, Xanthorrhoea preissii* and *Macrozamia riedlei, Eucalyptus wandoo* over *E. tetragona* and *Eucalyptus occidentalis* over *Acacia acuminata*. Soils vary from sandy clays to red loam over granite.

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

1. The landowners of subpopulations 1c and 1e, and population 4 have been notified of the presence of *Caladenia bryceana* subsp. *bryceana* ms on their properties.
2. A rabbit proof fence has recently been erected around population 2 (Wild Horse Swamp) to protect *Caladenia bryceana* subsp. *bryceana* ms and its habitat from rabbits.
3. The Department of Land Administration (DOLA) has been notified of the presence of subpopulation 1b on land managed by them. CALM is currently discussing with DOLA the possibility of including the site as part of an adjoining Class A nature reserve.
4. A leaflet drop to all landowners within the area of the known *Caladenia bryceana* subsp. *bryceana* ms populations has been undertaken.
5. An information sheet, which includes a description of the plant, its habitat type, threats and management actions has been produced.
6. The Threatened Flora Recovery Teams in CALM's Albany District and Central Forest Region will oversee the implementation of this IRP and report annually to CALM's Corporative Executive.

IRP Objective: The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the subspecies in the wild.

Recovery criteria
Criterion for success: The number of individuals within populations and/or the number of populations have increased.
Criterion for failure: The number of individuals within populations and/or the number of populations have decreased.
Recovery actions

1. Implement weed control	6. Promote awareness
2. Develop a fire management strategy	7. Obtain biological and ecological information
3. Collect seed	8. Relocate the information bay at population 3
4. Conduct further surveys	9. Develop a translocation proposal
5. Monitor populations	10. Write a full Recovery Plan

1. BACKGROUND

History

Caladenia bryceana subsp. bryceana ms was first found at Gnowangerup in September 1914 by Miss Bryce MacIntyre, after whom the species is named. It was reported to be growing in sandy soil near the bank of a salt pool. The species was described by R. S. Rogers in 1914, a copy of which is included under the heading Taxonomic description.

Caladenia bryceana is found in two widely separated areas (Kalbarri and Boyup Brook-Boxwood Hill) approximately 700 km apart. The orchid appears to be undergoing rapid evolution in these two areas and two subspecies are now recognised. *C. bryceana* subsp. *cracens* ms is found in the Kalbarri region and differs from *C. bryceana* subsp. *bryceana* in its larger leaf, slightly smaller flowers, taller, less globular labellum calli, and petals and lateral sepals that are curled at the margins.

Description

The tiny size of *Caladenia bryceana* subsp. *bryceana* ms (one of the smallest spider orchids known in WA) and its pale green and apricot colour make it extremely difficult to see. The leaf is 4-6 cm long, broadly lanceolate and semi-prostrate, and the flowering stem rarely exceeds 5 cm high. The flowers are borne singly (rarely two) on erect stems and are only about 1-1.5 cm across. The petals, labellum and sepals are usually green, occasionally apricot in colour. A distinctive band of glossy, dark globular calli run down the centre of the labellum. The two yellow glands that are commonly found at the base of the column in most "spider" caladenias are not present in *C. bryceana* subsp. *bryceana.*

Distribution and habitat

Caladenia bryceana subsp. *bryceana* ms is known from five populations over a range of approximately 190 km between Boyup Brook and Boxwood Hills. Surveys of these populations in the past have been *ad hoc* and the number of plants recorded within each has fluctuated over the years. The greatest number of plants recorded for any single population was 500+. This was for population 4 in 1992, but only 30 were seen in 1997.

Habitat varies over the subspecies range. Population 1 at Boxwood Hill grows in open woodland of *Eucalyptus wandoo* and *Allocasuarina huegeliana,* while population 2 at Wild Horse Swamp grows in open woodland of *E. rudis* over *Acacia acuminata, Xanthorrhoea preissii* and *Macrozamia riedlei* and population 3 in the Stirling Range National Park grows in an open woodland of *E. wandoo* with *E. tetragona* over very open low shrubs and grasses. Populations 4 and 5 at Toompup grow in open woodland of *E. occidentalis* over *A. acuminata* and low shrubs, sedges and herbs. The soils are sandy clays to red loam over granite.

Biology and ecology

The genus *Caladenia* (spider orchids, fairy orchids) is comprised of approximately 160 species, distributed widely over southern Australia and extending to New Zealand, New Caledonia and Java (Hoffman and Brown 1992). The genus appears to be rapidly speciating in parts of Australia and this is illustrated in particular by the presence of many species complexes in the south-west of Western Australia. Pollination studies of orchids show that intimate relationships exist between the flowers of some species of spider orchid and species of male thynnid wasp which attempt copulation with the labellum of the flower and in doing so remove or deposit pollinia (Stoutamire 1975).

Caladenia bryceana subsp. *bryceana* ms belongs to a section of *Caladenia* that includes species such as *C. doutchiae, C. roei, C. incrassata* ms*, C. cristata, C. voigtii* ms and *C. brevisura* ms. It is readily distinguished from these by its extremely small flower size and generally more south-western range of distribution. Like these species it is pollinated by male thynnid wasps.

The response *Caladenia bryceana* subsp. *bryceana* ms to summer fire (December-early May) is unknown, but, as it is so small and mostly occurs near cleared farmland, summer fire is likely to be followed by loss of habitat

due to invasive weeds (Robinson and Coates, 1995). It is also likely that the orchid would be killed by fire during its active growing period (late May-early November).

Threats

Caladenia bryceana subsp. *bryceana* ms was Declared as Rare Flora in March 1992 and ranked as Critically Endangered in September 1995. It currently meets World Conservation Union (IUCN) Red List Criteria C2a and B1+2c-e (IUCN 1994). The main threats are small population sizes, severe fragmentation, limited habitat and a continuing decline in quality of habitat, number of subpopulations and mature individuals. Other threats include inappropriate fire, weed invasion, grazing by rabbits and trampling. The wide scale clearing for agriculture throughout the southern Wheatbelt has probably resulted in the loss of much of its former habitat.

- **Inappropriate fire regimes** during the growing, flowering and reproductive phase of the orchid are likely to result in the death of the parent plant and low/nil seedling recruitment. High fire frequency may also lead to the degradation of the orchid's habitat.

- **Weeds** are evident in subpopulations 1a, 1g and population 2. Weeds will out-compete the orchid and a high level of palatable weeds will attract herbivorous animals, which are often not selective in their grazing. Weeds also increase the risk of fire frequency by modifying the native habitat to produce a higher level of flammable fuels at shorter intervals than the natural vegetation.

- **Rabbits** have damaged the habitat of population 2. Rabbit diggings, increased nutrient levels from rabbit droppings and grazing are all impacting on the habitat for the species.

- **Trampling** by tourists is evident in the area of population 3, which is adjacent to a car park and information bay. The trampling of the habitat is leading to the accidental destruction of plants and degradation of the habitat.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1A. Boxwood Hill	Private	1979 30	Moderate	Inappropriate fire, weeds
1B. Boxwood Hill	Class C Reserve ↑818	1979 5	Moderate	Inappropriate fire, weeds
1C. Boxwood Hill	Private	1983 0	Cleared	Cleared
1D. Boxwood Hill	Class A Nature Reserve ↑28687	1984 0	Moderate	Inappropriate fire, weeds
1E. Boxwood Hill	Private	1984 12	Moderate	Grazing, inappropriate fire weeds,
1F. Boxwood Hill	DOLA Location 120	1991 0	Moderate	Inappropriate fire, weeds
1G. Boxwood Hill	Class C Reserve ↑33257	1991 0	Moderate	Inappropriate fire, weeds
2. SW of Moodiarrup	Class A Nature Reserve ↑1740	1979 30 1998 25	Poor	Weeds, rabbits, inappropriate fire
3A. Stirling Range	National Park ↑14792	1985 30 1998 5	Good	Trampling, inappropriate fire
3B. Stirling Range	National Park ↑14792	1998 0	?	Trampling, inappropriate fire
3C. Stirling Range	National Park ↑14792	1989 15 1998 0	Good	Trampling, inappropriate fire
3D. Stirling Range	National Park ↑14792	1993 8 1998 0	Good	Trampling, inappropriate fire
3E. Stirling Range	National Park ↑14792	1993 1 1998 0	Good	Trampling, inappropriate fire
4. SW of Ongerup	Private	1992 500 1997 30	Good	Weeds, inappropriate fire
5. SW of Ongerup	Class A Nature Reserve ↑15756	1992 64 1997 23	Good	Inappropriate fire
6. Peniup Creek	Road Reserve	1998 4	Good	Inappropriate fire
7. Pallinup River	Recreation & Parklands Reserve	1997 50+	Good	Inappropriate fire, weeds

2. RECOVERY OBJECTIVES AND CRITERIA

Objectives

The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species in the wild.

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

3. RECOVERY ACTIONS

Existing recovery actions

The landowners of properties containing subpopulations 1c and 1e, and population 4 have been notified of the presence of *Caladenia bryceana* subsp. *bryceana* ms.

A rabbit proof fence has recently been erected around population 2 (Wild Horse Swamp) to protect *Caladenia bryceana* subsp. *bryceana* ms and its habitat.

The Department of Land Administration (DOLA) has been notified of the presence of subpopulation 1b on land managed by them. CALM is currently discussing with DOLA the possibility of including the site into adjoining Class A nature reserve.

A leaflet drop to all landowners in the area of known *Caladenia bryceana* subsp. *bryceana* ms populations has been undertaken.

The Threatened Flora Recovery Teams for CALM's Albany District and Central Forest Region will oversee the implementation of this IRP and report annually to CALM's Corporative Executive.

Future recovery actions

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. Implement weed control

Habitat of subpopulations 1a and 1g at Boxwood Hill, and population 2 at Wild Horse Swamp is weed infested. A weed control program will involve:

1. Selection of an appropriate herbicide after determining which weeds are present.
2. Controlling invasive weeds by hand removal and spot spraying when weeds first emerge.
3. Scheduling to include weed spraying of other Declared Rare Flora (DRF) populations requiring weed control within the Albany and Mornington Districts.

Action: Implement weed control for subpopulations 1a, 1g and population 2
Responsibility: CALM (Albany and Mornington Districts, Science and Information Division (SID)) through the ADTFRT, CFRTFRT
Cost: $950 p.a.

2. Develop a fire management strategy

It is likely that *Caladenia bryceana* subsp. *bryceana* ms is not harmed by fire between December and April but fires during the growing, flowering and seeding phase (July-October) may affect the long term survival of the orchid. Fires also promote the introduction and proliferation of weed species. Fire management for population 3 is covered in the Stirling Range and Porongurup National Parks Draft Management Plan.

Action: Develop a fire management strategy
Responsibility: CALM (Albany and Mornington Districts) through the ADTFRT, CFRTFRT, relevant authorities and land managers
Cost: $900 in year 1.

3. Collect seed

Preservation of germplasm is essential to guard against extinction if wild populations are lost. Seed collections are needed to propagate plants for translocations (see 9).

Action: Collect seed
Responsibility: CALM (Threatened Flora Seed Centre (TFSC), Albany and Mornington Districts) through the ADTFRT, CFRTFRT, Kings Park and Botanic Garden (KPBG)
Cost: $1,600 in year 1.

4. Conduct further surveys

Further surveys supervised by CALM staff, and with the assistance of West Australian Native Orchid Study and Conservation Group, wildflower societies and naturalist clubs, will be conducted for *Caladenia bryceana* subsp. *bryceana* ms during its flowering period (August to mid September).

Action: Conduct further surveys
Responsibility: CALM (Albany and Mornington Districts) through the ADTFRT, CFRTFRT
Cost: $1,100 p.a.

5. Monitor populations

Monitoring of factors such as weed encroachment, habitat degradation, population stability (expanding or declining), pollination activity, seed production, recruitment and longevity is essential.

Action: Monitor populations
Responsibility: CALM (Albany and Mornington Districts) through the ADTFRT, CFRTFRT
Cost: $1,100 p.a.

6. Promote awareness

The importance of biodiversity conservation and the protection of *Caladenia bryceana* subsp. *bryceana* ms will be promoted to the public. This will be achieved through an information campaign using the local print and electronic media and by setting up poster displays. This is especially important as most populations of the species are small and many are highly threatened, and an increased awareness may result in the discovery of others.

An information sheet, which includes a description of the plant, its habitat type, threats and management actions has been produced. The preparation of a poster illustrating all Critically Endangered flora species in the District is recommended. Formal links with local naturalist groups and interested individuals will be encouraged.

Action: Promote awareness
Responsibility: CALM (Albany and Mornington Districts, WATSCU, Corporate Relations Division) through the ADTFRT, CFRTFRT
Cost: $500 in year 1 and $2,100 in year 2.

7. Obtain biological and ecological information

Research designed to increase an understanding of the biology of the species will provide a scientific base for management of *Caladenia bryceana* subsp. *bryceana* ms in the wild. Research will include:

1. Effects of weeds on recruitment and establishment.
2. Pollination biology.
3. Seed germination requirements.
4. Longevity of plants, and time taken to reach maturity.
5. Habitat response to herbicide treatments.
6. Response of *Caladenia bryceana* subsp. *bryceana* ms and its habitat to fire.
7. Genetic variability within and between populations.

Action: Obtain biological and ecological information
Responsibility: CALM (SID, Albany and Mornington Districts) through the ADTFRT, CFRTFRT
Cost: $15,000 p.a.

8. Relocate the information bay

Population 3 is adjacent to an information bay which should be moved to reduce the chance of inadvertent picking and trampling of the orchid by visitors. Surveys should be conducted for *Caladenia bryceana* subsp. *bryceana* ms in habitat adjacent to population 3 before the relocation of the information bay.

Action: Relocate the information bay
Responsibility: CALM (Albany District) through the ADTFRT
Cost: $1,000 in year 1.

9. Develop a translocation proposal

Background 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*. Translocation is considered as desirable for the conservation of a species if populations are in rapid decline. Although translocations are generally

undertaken under full Recovery Plans it is possible to develop a translocation proposal, search for suitable translocation sites and start growing plants within the timeframe of an IRP. All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Develop a translocation proposal
Responsibility: CALM (Albany and Mornington Districts) through the ADTFRT, CFRTFRT
Cost: $4,000 in year 3.

10. Write a full Recovery Plan

At the end of the three-year term 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 prepared with the benefit of knowledge gained over the period of this Interim Recovery Plan.

Action: Write a full Recovery Plan
Responsibility: CALM (Albany and Mornington Districts) through the ADTFRT, CFRTFRT
Cost: $17,500 in year 3.

4. TERM OF PLAN

This Interim Recovery Plan will operate from June 1999 to May 2001 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is longer ranked as Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

5. ACKNOWLEDGMENTS

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

Ellen Hickman	Former Conservation Officer, CALM Albany District
Val English	Ecologist CALM WATSCU
Wendy and Jody Cusack	Flora volunteers, Moodiarrup

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.

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7. TAXONOMIC DESCRIPTION (Draft, S.D. Hopper and A. P. Brown)

Differs from *Caladenia bryceana* subsp. *cracens* in its larger, more colourful flowers with petals and lateral sepals flattened at the margins and spreading just below the horizontal when fully open; its column with prominently rounded lobes; its labellum with dark-purplish broadly globular calli present in the middle of the lamina; its somewhat smaller leaf; its southern distribution between Boyup Brook and Boxwood Hills; and its later flowering period.