

INTERIM RECOVERY PLAN NO. 232

CAPE SPIDER ORCHID

(*Caladenia caesarea* subsp. *maritima*)

INTERIM RECOVERY PLAN

2007-2012



February 2007

Department of Environment and Conservation
Kensington



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. Note: the Department of CALM formally became the Department of Environment and Conservation (DEC) in July 2006.

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

DEC is committed to ensuring that threatened taxa and threatened ecological communities are conserved through the preparation and implementation of Recovery Plans (RPs) or IRPs, and by ensuring that conservation action commences as soon as possible and, in the case of Critically Endangered (CR) taxa and communities, always within one year of endorsement of that rank by the Minister.

This IRP will operate from February 2007 to January 2012 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked CR, this IRP will be reviewed after five years and the need for further recovery actions assessed.

This IRP was given regional approval on 20 May 2007 and approved by the Director of Nature Conservation on 11 June 2007. The allocation of staff time and provision of funds identified in this IRP is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this IRP was accurate as at February 2007.

IRP PREPARATION

This IRP was prepared by Craig Douglas¹ and Janine Liddelow²

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ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this IRP:

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Andrew Brown	Threatened Flora Coordinator, Species and Communities Branch, DEC
Andrew Crawford	Technical Officer, Threatened Flora Seed Centre, DEC
Frances Kirchner	Biodiversity Conservation Initiative Project Officer, DEC
Luke Sweedman	Curator, Western Australian Seed Technology Centre, Botanic Gardens and Parks Authority
Robyn Luu	Project Officer, Species and Communities Branch, DEC, Kensington

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and DEC's Species and Communities Branch for assistance.

Cover photograph by Andrew Brown.

CITATION

This IRP should be cited as:

Department of Environment and Conservation (2007) Cape Spider Orchid (*Caladenia caesarea* subsp. *maritima*) Interim Recovery Plan 2007-2012. Interim Recovery Plan No. 232. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name:	<i>Caladenia caesarea</i> subsp. <i>maritima</i>	Common Name:	Cape Spider Orchid
Family:	Orchidaceae	Flowering Period:	August - September
DEC Region:	South West	DEC District:	Blackwood
Shire:	Busselton	Recovery Team:	South West Region Threatened Flora Recovery Team

Illustrations and/or further information: Brown, A.P., Thomson-Dans, C. and Marchant, N. (1998) *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Perth, Western Australia; *Western Australian Herbarium FloraBase 2 – Information on the Western Australian Flora* (2006) <http://www.calm.wa.gov.au/science/> Department of Environment and Conservation, Perth, Western Australia; Hoffman, N. and Brown, A. (1998) *Orchids of South-West Australia*. Revised 2nd edition with supplement. University of Western Australia Press, Perth, Western Australia; Hopper, S.D. and Brown, A.P. (2001) *Contributions to Western Australian Orchidology: 2. New taxa and circumscriptions in Caladenia* (Spider, Fairy and Dragon Orchids of Western Australia). *Nuytsia*. 14(1/2): 201-203, Figs 44, 45.

Current status: *Caladenia caesarea* subsp. *maritima* was declared as Rare Flora in 1991 under the *Western Australian Wildlife Conservation Act 1950* and was ranked as Critically Endangered (CR) under World Conservation Union (IUCN 1994) Red List criteria B1+2c; C2a, as there were less than 250 mature individuals known at that time and as there was continuing decline in quality of habitat and number of mature plants. However, as additional mature plants have since been found and there is no observable decline, the species no longer meets CR based on the above criteria. It is therefore proposed in Recovery Action 2 to recommend to the Threatened Species Scientific Committee (TSSC) that the ranking of *Caladenia caesarea* subsp. *maritima* be amended from CR B1+2c; C2a to Vulnerable (VU) D1. The subspecies is listed as Endangered (EN) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The main threats are recreational activities, weed invasion, inappropriate fire regimes and grazing.

Surveys conducted in Spring 2006 indicate that *Caladenia caesarea* subsp. *maritima* consists of six populations, totalling 658 mature plants. Five populations (Populations 1, 2, 3, 4 and 6) are located on lands vested with the Shire of Busselton and one population (Population 5) is located on Private Property.

Description: *Caladenia caesarea* subsp. *maritima* grows to between 15 and 20 cm high and has between one and three mustard yellow flowers with stiffly held petals and sepals. Each flower is 5 to 6 cm long and 4 to 5 cm wide with a prominent yellow and brown striped labellum (lip) that is thrust well forward, before curving slightly downward at the tip. The leaf is 6 to 9 cm long and 2 to 4 mm wide (Brown *et. al.* 1998). *Caladenia caesarea* subsp. *maritima* is distinguished from *C. caesarea* subsp. *caesarea* by its slightly smaller flowers, coastal, rather than inland distribution and an earlier flowering period (Brown *et. al.* 1998).

Habitat requirements: *Caladenia caesarea* subsp. *maritima* occurs in shallow pockets of red-brown sandy loam on coastal granite outcrops in the Cape Naturaliste area and also more rarely under dense thickets of *Calothamnus graniticus* in deeper soils surrounding the granite outcrops. A northern outlying population is located in Tuart forest near Ludlow where plants grow in open forest in an open herbaceous understorey (Hopper and Brown 2001).

Habitat critical to the survival of the species, and important populations: Given that *Caladenia caesarea* subsp. *maritima* is ranked as CR, it is considered that all known habitat for wild populations is critical to the survival of the subspecies, and that all wild populations are important populations. Habitat critical to the survival of *C. caesarea* subsp. *maritima* includes the area of occupancy of extant populations, areas of similar habitat (i.e. shallow pockets of red-brown sandy loams on coastal granite outcrops and dense thickets of *Calothamnus graniticus* in deeper soils near granite outcrops surrounding and linking important populations (this is necessary to allow access for pollinators i.e. thynnid wasps), and additional occurrences of similar habitat that may contain the subspecies or be suitable for future translocations.

Benefits to other species or ecological communities: *Caladenia caesarea* subsp. *maritima* occurs within the 'Calothamnus graniticus heaths on South-West coastal granites' Threatened Ecological Community (TEC). This TEC is ranked as Vulnerable in Western Australia. Priority 4 flora species *Calothamnus graniticus* subsp. *graniticus* and *Boronia tenuis* also occur with the taxon. Recovery actions implemented to improve the quality or security of the habitat of *C. caesarea* subsp. *maritima* will also assist in protecting the TEC and species of Priority flora that occur in association.

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. *Caladenia caesarea* subsp. *maritima* is not listed under any specific international treaty however, and therefore this 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 of Aboriginal significance are known at or near populations of the subspecies. However, the involvement of the indigenous community is currently being sought to determine whether there are any issues or interests identified in the plan. If no role is identified for indigenous communities in the recovery of this subspecies, opportunities may exist through cultural interpretation and awareness of the subspecies.

The advice of the South West Aboriginal Land and Sea Council (SWALSC) and Department of Indigenous Affairs is being sought to assist in the identification of potential indigenous management responsibilities for land occupied by this threatened subspecies, or groups with a cultural connection to land that is important for the subspecies' conservation.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact: The implementation of this recovery plan is unlikely to cause significant adverse social and economic impact. However, as one subpopulation of *Caladenia caesarea* subsp. *maritima* occurs on private property the protection of it may potentially affect development and asset protection measures on this site. Where populations are located on private property, recovery actions refer to continued liaison between stakeholders with regards to these areas.

Affected interests: Stakeholders potentially affected by the implementation of this plan include managers of land on which the subspecies occurs, and this includes the private property owner, the Shire of Busselton and Landgate (previously Department of Land Information).

Evaluation of the plan's performance: DEC in conjunction with the South West Region Threatened Flora Recovery Team (SWRTFRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following four years of implementation.

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

1. Land managers including a private land owner and the Shire of Busselton have been made aware of the threatened status of *Caladenia caesarea* subsp. *maritima*, its location and their legal obligations to protect it.
2. A comprehensive survey of all populations of *Caladenia caesarea* subsp. *maritima* was conducted in 1997 and again in 2006.
3. Seed collections of *Caladenia caesarea* subsp. *maritima* are stored with the Botanic Gardens and Parks Authority (BGPA).
4. The SWRTFRT is overseeing the implementation of this IRP and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.
5. Staff from DEC's Blackwood District monitor all known populations.

IRP objective: The objective of this IRP is to abate identified threats and maintain or enhance viable *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery criteria

Criteria for success: The number of populations have increased and/or the number of mature individuals in populations have increased by ten percent or more over the term of the plan.

Criteria for failure: The number of populations have decreased and/or the number of mature individuals in populations have decreased by ten percent or more over the term of the plan.

Recovery actions

1. Coordinate recovery actions	7. Develop and implement a fire management strategy
2. Propose ranking change	8. Confirm the identity of a northern outlying population of <i>Caladenia caesarea</i> subsp. <i>maritima</i>
3. Liaise with relevant land managers and Indigenous groups	9. Map habitat critical to the survival of <i>Caladenia caesarea</i> subsp. <i>maritima</i>
4. Monitor populations	10. Obtain biological and ecological information
5. Undertake weed control, monitor effectiveness and implement additional control if required	11. Conduct further surveys
6. Develop and implement a grazing control strategy	12. Review the IRP and need for further recovery actions

1. BACKGROUND

History

Caladenia caesarea subsp. *maritima*, which was first collected from the Meelup area by Bruce Maslin in 1972 and included in *Orchids of South West Australia* in 1992 (Hoffman and Brown 1992), was formally described in 2001 (Hopper and Brown 2001).

The subspecies is known from six populations, containing seven subpopulations, totalling 658 mature plants on coastal granite outcrops between Dunsborough and Cape Naturaliste.

Description

Caladenia caesarea subsp. *maritima* grows from 15 to 20 cm high and has one to three flowers that are distinguished by their stiffly held petals and sepals. Each flower is 5 to 6 cm long and 4 to 5 cm wide with a prominent yellow and brown striped labellum (lip) that is thrust well forward, before curving slightly downward at the tip. The leaf is 6 to 9 cm long and 2 to 4 mm wide (Brown *et al.* 1998).

The subspecies is distinguished from *Caladenia caesarea* subsp. *caesarea* by its slightly smaller flowers, coastal, rather than inland distribution and earlier flowering period (Brown *et al.* 1998).

Distribution and habitat

Caladenia caesarea subsp. *maritima* has a restricted distribution of approximately 3.6 km² between Dunsborough and Cape Naturaliste, growing in shallow red-brown sandy loam on coastal granite outcrops or more rarely under dense thickets of *Calothamnus graniticus* in nearby deeper soils. A northern outlying population is reportedly located in Tuart forest near Ludlow but is yet to be verified. Species associated with *Caladenia caesarea* subsp. *maritima* in the Cape Naturaliste area include *Calothamnus graniticus*, *Hakea trifurcata*, *Darwinia citriodora*, *Gastrolobium spinosum* and *Acacia pulchella*.

Summary of population land vesting, purpose and management

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1a NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
1b NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
1c NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
1d NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
1e NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
2 NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
3a NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
3b NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
4 NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton
5 NW of Dunsborough	Blackwood	Busselton	Freehold	Private Property	Landholders
6 NW of Dunsborough	Blackwood	Busselton	Shire of Busselton	Conservation and Recreation	Shire of Busselton

Populations in **bold text** are considered to be important populations

Biology and ecology

Caladenia caesarea subsp. *maritima* is a herbaceous perennial that emerges annually from underground summer dormant tubers and has above ground vegetative parts between April and late October. Flowering occurs between mid August and September with each flower opening for three to ten days. Pollination is by a male thynnid wasp which has been shown to be influenced by prevailing climatic conditions during the orchids' brief flowering period of (Williams *et al.* 2001).

The subspecies does not require fire to flower and plants burnt while they are actively growing are likely to be damaged or killed.

Germination trials conducted by the Botanic Gardens and Parks Authority (BGPA) indicate that approximately 50% of *Caladenia caesarea* subsp. *maritima* seed is typically viable.

Threats

Caladenia caesarea subsp. *maritima* was declared as Rare Flora in 1991 under the Western Australian *Wildlife Conservation Act 1950* and was ranked as Critically Endangered (CR) under World Conservation Union (IUCN 1994) Red List criteria B1+2c; C2a, as there were less than 250 mature individuals known at that time and as there was continuing decline in quality of habitat and number of mature plants. However, as additional mature plants have since been found and there is no observable decline, the species no longer meets CR based on the above criteria. It is therefore proposed in Recovery Action 2 to recommend to the Threatened Species Scientific Committee (TSSC) that the ranking of *Caladenia caesarea* subsp. *maritima* be amended from CR B1+2c; C2a to Vulnerable (VU) D1. The subspecies is listed as Endangered (EN) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The main threats are recreational activities, weed invasion, inappropriate fire regimes and grazing.

Surveys conducted in Spring 2006 indicate that *Caladenia caesarea* subsp. *maritima* consists of six populations, totalling 658 mature plants. Five populations (Populations 1, 2, 3, 4 and 6) are located on lands vested with the Shire of Busselton and one population (Population 5) is located on Private Property.

- **Recreational activities** are currently a minor threat to the subspecies as most populations are located in close proximity to the coastal walk trail.
- **Weed invasion** is currently a threat to this subspecies in areas where rabbits have damaged the habitat. Weeds compete for resources with *Caladenia caesarea* subsp. *maritima* and reduce plant numbers. Annual weed species also increase fuel loads and increase the frequency of fire and allow fires to occur earlier in the year when the taxon is in a vulnerable growth stage.
- **Inappropriate fire regimes.** Plants are thought to be damaged or killed by fire during their active growing phase (April to October) during which time tubers are being replaced.
- **Grazing** by kangaroos and rabbits is reported to be a threat to several populations of *Caladenia caesarea* subsp. *maritima*. Although grazing has not been observed to kill individual plants it has the potential to reduce reproductive output through the removal of flower spikes and damage to associated habitat.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1a NW of Dunsborough	Parkland reserve	1997 100 2006 74	Healthy	Grazing, inappropriate fire regimes, recreational activities
1b NW of Dunsborough	Parkland reserve	1997 20 2006 30	Healthy	Recreational activities, grazing
1c NW of Dunsborough	Parkland reserve	1996 20 1997 100 2001 7 2006 50	Healthy	Grazing, weeds, recreational activities
1d NW of Dunsborough	Parkland reserve	1997 12 2006 70	Healthy	Inappropriate fire regimes
1e NW of Dunsborough	Parkland reserve	2006 46	Healthy	Grazing, inappropriate fire regimes
2 NW of Dunsborough	Unallocated Crown Land	1996 Unknown 2006 81	Moderate	Weeds, grazing, inappropriate fire regimes
3a NW of Dunsborough	Parkland reserve	1997 6 2001 57 2004 5	Healthy	Recreational activities, grazing

		2006	30		
3b NW of Dunsborough	Parkland reserve	1997	0	Healthy	Inappropriate fire regimes
		2001	8		
		2004	21		
		2006	90		
4 NW of Dunsborough	Parkland reserve	1997	5	Healthy	Recreational activities, grazing, weeds
		2000	4		
		2004	20		
		2006	138		
5 NW of Dunsborough	Private Property	1997	3	Healthy	Recreational activities
6 NW of Dunsborough	Parkland reserve	2006	46	Healthy	Inappropriate fire regimes

Populations in **bold text** are considered to be Important Populations

Guide for decision-makers

Section 1 provides details of current and possible future threats. Development and/or land clearing in the immediate vicinity of populations of *Caladenia caesarea* subsp. *maritima* require assessment. Developments or clearing should not be approved unless the proponents can demonstrate that their actions will have no significant impact on the subspecies, its habitat or potential habitat or on the local surface hydrology, such that drainage in the habitat of the subspecies would be altered.

Habitat critical to the survival of the species, and important populations

Given that *Caladenia caesarea* subsp. *maritima* is ranked as CR, it is considered that all known habitat for wild populations is critical to the survival of the subspecies, and that all wild populations are important populations. Habitat critical to the survival of *C. caesarea* subsp. *maritima* includes the area of occupancy of extant populations, areas of similar habitat (i.e. shallow pockets of red-brown sandy loams on coastal granite outcrops and dense thickets of *Calothamnus graniticus* in deeper soils near granite outcrops) surrounding and linking populations (this is necessary to allow access for pollinators i.e. thynnid wasps), and additional occurrences of similar habitat that may contain the subspecies or be suitable for future translocations.

Benefits to other species or ecological communities

Caladenia caesarea subsp. *maritima* occurs in a Threatened Ecological Community (TEC).

TEC Title	Conservation status (Western Australia)
<i>Calothamnus graniticus</i> heaths on South-West coastal granites	Vulnerable

For a description of the TEC categories see English and Blyth (1999)

Two priority flora taxa found with *Caladenia caesarea* subsp. *maritima* are listed in the table below.

Taxon name	Conservation Status (Western Australia)	Conservation Status (EPBC Act, 1999)
<i>Calothamnus graniticus</i> subsp. <i>graniticus</i>	Priority 4	-
<i>Boronia tenuis</i>	Priority 4	-

For a description of priority categories see Atkins (2006)

Recovery actions implemented to improve the quality or security of habitat of *Caladenia caesarea* subsp. *maritima* will also assist in protecting the above TEC and Priority Flora.

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. *Caladenia caesarea* subsp. *maritima* is not listed under any specific international treaty however, and therefore this 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 of Aboriginal significance are known at or near populations of the subspecies covered by this IRP. However, the involvement of the indigenous community is currently being sought to determine whether there are any issues or interests identified in the plan. If no role is identified for indigenous communities in the recovery of this subspecies, opportunities may exist through cultural interpretation and awareness of the subspecies.

The advice of the South West Aboriginal Land and Sea Council (SWALSC) and Department of Indigenous Affairs is being sought to assist in the identification of potential indigenous management responsibilities for land occupied by this threatened subspecies, or groups with a cultural connection to land that is important for the subspecies' conservation.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact

The implementation of this recovery plan is unlikely to cause significant adverse social and economic impact. However, as one subpopulation of *Caladenia caesarea* subsp. *maritima* occurs on private property the protection of it may potentially affect development and asset protection measures on this site. Recovery actions refer to continued liaison between stakeholders with regard to populations located on private property.

Affected interests

Stakeholders potentially affected by the implementation of this plan include managers of land on which the subspecies occurs, including a private property owner, the Shire of Busselton and Landgate.

Evaluation of the plan's performance

The DEC in conjunction with the South West Region Threatened Flora Recovery Team (SWRTFRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following four years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objectives:

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

Criteria for success: The number of populations have increased and/or the number of mature individuals in populations have increased by ten percent or more over the term of the plan.

Criteria for failure: The number of populations have decreased and/or the number of mature individuals in populations have decreased by ten percent or more over the term of the plan.

3. RECOVERY ACTIONS

Existing recovery actions

Land managers, including private landowners and the Shire of Busselton, have been made aware of the threatened nature of the subspecies, its location and their legal obligations to protect it.

A comprehensive survey of all populations of *Caladenia caesarea* subsp. *maritima* was conducted in Spring 1997 and 2006 by staff from DEC's Species and Communities Branch (SCB) and Blackwood District.

Seed from the taxon was collected in 2003 by BGPA who currently hold approximately 20,000 seeds from eight plants.

The SWRTFRT is overseeing the implementation of this IRP and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Staff from DEC's Blackwood District monitor all populations.

Future recovery actions

Where recovery actions are implemented on lands other than those managed by DEC, permission has been or will be sought from the appropriate land managers prior to actions being undertaken. The following recovery actions are roughly in order of descending priority, influenced by their timing over the term of the plan. However this should not constrain addressing any recovery action if funding is available and other opportunities arise.

1. Coordinate recovery actions

The SWRTFRT will continue to coordinate the implementation of recovery actions for *Caladenia caesarea* subsp. *maritima* and will include information on progress in their annual reports to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: DEC (Blackwood District) through the SWRTFRT
Cost: \$1,400 per year

2. Propose ranking change

Propose to the next meeting of the Threatened Species Scientific Committee (TSSC) that the ranking of *Caladenia caesarea* subsp. *maritima* be amended from CR B1+2c; C2a to VU D1. The subspecies no longer meets Criteria for CR as there are now more plants known and there are no known threatening processes.

Action: Propose ranking change
Responsibility: DEC (Species and Communities Branch and Blackwood District) through the SWRTFRT
Cost: \$1,000 in first year.

3. Liaise with relevant land managers and Indigenous groups

Staff from DEC's Blackwood District will liaise with appropriate land managers to ensure that populations of *Caladenia caesarea* subsp. *maritima* are not accidentally damaged or destroyed. As such, liaison is required with the Shire of Busselton who conducts control burns of vegetation surrounding the habitat of the subspecies. Input and involvement will also be sought from any Aboriginal groups that have an active interest in areas that are habitat of the subspecies.

Action: Liaise with relevant land managers and Indigenous groups
Responsibility: DEC (Blackwood District) through the SWRTFRT
Cost: \$1,800 per year

4. Monitor populations

Monitoring of factors such as weed invasion, grazing, habitat degradation, population stability (expansion or decline), pollinator activity, seed production, recruitment, and longevity is essential. Populations will be inspected annually and Rare Flora Report Forms completed. Population 5 has not been surveyed since 1997 and requires resurvey to accurately gauge population size, health and threats.

Action: Monitor populations
Responsibility: DEC (Blackwood District) through the SWRTFRT
Cost: \$1,300 per year

5. Undertake weed control, monitor effectiveness and implement additional control if required

As weeds are currently a threat to Populations 2 and 4, and Subpopulations 1c and 3a, of *Caladenia caesarea* subsp. *maritima* the following actions will be implemented:

1. Select appropriate herbicides after determining which weeds are present.
2. Control invasive weeds by hand removal or spot spraying around plants of the subspecies when weeds first emerge.
3. Schedule weed control to include spraying at other threatened flora populations within the District.
4. Regularly monitor weeds and implement additional weed control if required.

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

Action: Undertake weed control, monitor effectiveness and implement additional control if required
Responsibility: DEC (Blackwood District, Science Division) through the SWRTFRT
Cost: \$5,600 per year

6. Develop and implement a grazing control strategy

Grazing by rabbits (*Oryctolagus cuniculus*) and kangaroos (*Macropus fuliginosus*) threatens several populations of *Caladenia caesarea* subsp. *maritima*. Methods of controlling grazing be investigated and a control strategy will be developed and implemented.

Action: Develop and implement a grazing control strategy
Responsibility: DEC (Blackwood District) through the SWRTFRT
Cost: \$6,000 in the first year for development and implementation; \$3,700 per year for implementation thereafter

7. Develop and implement a fire management strategy

Caladenia caesarea subsp. *maritima* is thought to be killed by fire if it occurs during the plants' active growth period. To minimize future damage, it is important that a fire regime with appropriate fire frequency and season be applied to areas occupied by the subspecies.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Blackwood District) through the SWRTFRT, and relevant authorities
Cost: \$2,100 in the first year for development; \$1,500 per year thereafter for implementation

8. Confirm the identity of a northern outlying population of *Caladenia caesarea* subsp. *maritima*

Surveys will be conducted to relocate an outlying population in Ludlow Tuart forest (Hopper and Brown 2001) and genetic techniques will be used to verify that it is *Caladenia caesarea* subsp. *maritima*.

Action: Confirm the identity of a northern outlying population of *Caladenia caesarea* subsp. *maritima*
Responsibility: DEC (Science Division) through SWRTFRT
Cost: \$13,000 in the second year

9. Map habitat critical to the survival of *Caladenia caesarea* subsp. *maritima*

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

Action: Map critical habitat critical to the survival of *Caladenia caesarea* subsp. *maritima*
Responsibility: DEC (Blackwood District and SCB) through the SWRTFRT
Cost: \$1,000 in the second year

10. Obtain biological and ecological information

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

1. Pollinator activity and effectiveness.
2. Seed viability.
3. Conditions necessary for germination.
4. Longevity of plants.

Action: Obtain biological and ecological information
Responsibility: DEC (Science Division, Blackwood District) through the SWRTFRT
Cost: \$11,000 in the first year; \$9,000 in the second year

11. Conduct further surveys

Further surveys by DEC staff and, where possible, volunteers from the local community, wildflower societies and naturalists clubs will be conducted during the flowering period of the subspecies (August to September).

Action: Conduct further surveys
Responsibility: DEC (Blackwood District) through the SWRTFRT
Cost: \$3,000 in the first, third and fifth years

12. Review the IRP and need for further recovery actions

At the end of its five-year term the IRP will be reviewed and the need for further recovery actions will be assessed.

Action: Review the IRP and the need for further recovery actions
Responsibility: DEC (SCB, Blackwood District) through the SWRTFRT
Cost: \$1,500 in the fifth year

Summary of recovery actions

Recovery Actions	Priority	Responsibility	Completion date
Coordinate recovery actions	High	SWRTFRT	Ongoing
Propose ranking change	High	DEC (SCB, Blackwood District) through the SWRTFRT	2008
Liaise with relevant land managers and Indigenous groups	High	DEC (Blackwood District) through the SWRTFRT	Ongoing
Monitor populations	High	DEC (Blackwood District) through the SWRTFRT	Ongoing
Undertake weed control, monitor effectiveness and implement additional control if required	High	DEC (Blackwood District, Science Division) through the SWRTFRT	Ongoing
Develop and implement a grazing control strategy	High	DEC (Blackwood District) through the SWRTFRT	Development by 2008 with implementation ongoing
Develop and implement a fire management strategy	High	DEC (Blackwood District) through the SWRTFRT, and relevant authorities	Development by 2008 with implementation ongoing
Confirm the identity of a northern outlying population of <i>Caladenia caesarea</i> subsp. <i>maritima</i>	High	DEC (Science Division) through SWRTFRT	2009
Map habitat critical to the survival of <i>Caladenia caesarea</i> subsp. <i>maritima</i>	Moderate	DEC (Blackwood District) through the SWRTFRT	2009

Obtain biological and ecological information	Moderate	DEC (Science Division, Blackwood District) through the SWRTFRT	2009
Conduct further surveys	Moderate	DEC (Blackwood District) through the SWRTFRT	2012
Review the IRP and need for further recovery actions	Moderate	DEC (SCB, Blackwood District) through the SWRTFRT	2012

4. TERM OF PLAN

This IRP will operate from February 2007 to January 2012 but will remain in force until withdrawn or replaced. If the taxon is still ranked CR after five years, the need for further recovery actions and an update of this IRP will be assessed.

5. REFERENCES

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6. TAXONOMIC DESCRIPTION

Excerpt from: Hopper and Brown (2001) Contributions to Western Australian Orchidology: 2. New taxa and Circumscriptions in *Caladenia* (Spider, Fairy and Dragon Orchids of Western Australia). *Nuytsia*. **14(1/2)**: 201.

Flowers 4-5 cm across. *Dorsal sepal* 2.5-6 cm x 2-2.5 mm. *Lateral sepals* 2.5-6 cm x 2-2.5 mm. *Petals* 2.5-5 cm x 2-3 mm. *Labellum lamina* 10-15 x 6-9 mm; apical third slightly down curved. The subspecies differs from *Caladenia caesarea* subsp. *caesarea* in its smaller flowers and its earlier flowering period, while from *C. caesarea* subsp. *transiens* it differs in its protruding labellum apex and near-coastal habitat.

Key to subspecies of *Caladenia caesarea*

- 1. Labellum apex protruding, often only partially recurved 2
- 2. Lateral sepals 4.5–8 cm long and 3–4.5 mm wide; petals 4.5–6.5 cm long; labellum 12–16 mm long and 9–11 mm wide; wet flats between Tenterden and Busselton subsp. **caesarea**
- 2: Lateral sepals 2.3–6 cm long and 2–2.5 mm wide; petals 2.5–5 cm long; labellum 10–15 mm long and 6–9 mm wide; coastal granites near Dunsborough subsp. **maritima**
- 1: Labellum apex evenly recurved subsp. **transiens**