INTERIM RECOVERY PLAN NO. 276

BALLERINA ORCHID

(*Caladenia melanema*)

INTERIM RECOVERY PLAN

2007-2012

April 2007

Department of Environment and Conservation
Kensington

Natural Heritage Trust
Helping Communities Helping Australia
An Australian Government Initiative

Government of Western Australia

Department of Environment and Conservation

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 ecological communities, and begin the recovery process.

DEC is committed to ensuring that Threatened taxa and 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This IRP will operate from April 2007 to March 2012 but will remain in force until withdrawn or replaced. It is intended that, if the species is still ranked as CR at the end of the five-year term, this IRP will be reviewed and the need for further recovery actions assessed.

This IRP was given regional approval on 19 August 2008 and was approved by the Director of Nature Conservation on 12 September 2008. 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 at April 2007.

IRP PREPARATION

This IRP was prepared by Craig Douglas[1], Bethea Loudon[2] and Amanda Fairs[3]

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Andrew Brown Threatened Flora Coordinator, Species and Communities Branch, DEC

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). Ballerina orchid (*Caladenia melanema*) Interim Recovery Plan 2007-2012. Interim Recovery Plan No. 276. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name	***Caladenia melanema***	**Common Name**	Ballerina orchid
Family	Orchidaceae	**Flowering Period**	August – September
DEC Region	Wheatbelt	**DEC District**	Great Southern
Shire	Kent	**Recovery Team**	Great Southern District Threatened Flora Recovery Team
NRM Region	Avon		

Illustrations and/or further information: Hoffman, N. and Brown, A. (1992). *Orchids of south-west Australia (2nd Ed.)*. Perth, University of Western Australia Press. pp 28; 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)**: 248-9, Figs 59, 60 (map); DEC (2007) *Western Australian Herbarium FloraBase 2 – Information on the Western Australian Flora*. Department of Environment and Conservation, Western Australia. Accessed 2007. http://www.calm.wa.gov.au/science/.

Current status: *Caladenia melanema* was declared as Rare Flora in 2004 under the Western Australian *Wildlife Conservation Act 1950* and is currently ranked as Critically Endangered (CR) under World Conservation Union (IUCN 2001) Red List criteria B2ab(iii); C2a(ii), due to the species area of occupancy being less than 10 km^2 with total population size numbering fewer than 250 mature individuals with no subpopulation containing more than 50 mature individuals and a continuing decline in the areal extent and quality of habitat. Currently the species is not listed under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats are road maintenance, grazing, salinity, weed invasion, inappropriate fire regimes and small population size. *Caladenia melanema* is known from one population (two subpopulations) totaling approximately 33 mature plants near Pingrup in DEC's Great Southern District.

Description: *Caladenia melanema* is an erect tuberous, perennial 8 to 15 cm high, occurring as solitary individuals or in small, clumps. Plants have a single slender, erect, pale green, densely hairy leaf, 4 to 12 cm long and 2 to 7 mm wide. The one or two flowers are 4 to 6 cm long and 4 to 5 cm wide with cream petals and sepals, sometimes with a dark maroon vein down their centre. Petals and sepals have tiny, dark red-black globular hairs on the outer two thirds, giving them a reddish-black tinge. The labellum, which is white to cream with numerous broken lines and red-maroon blotches, has two narrow rows of cream calli and curls under at the tip. Flowers have a strong smell similar to the odour of burning metal. Seed capsules dehisce to release numerous, small (pepper-like) seeds through slits in the side when mature (Louden, 2006).

Habitat critical to the survival of the species, and important populations: Given that *Caladenia melanema* is ranked as CR, it is considered that all known habitat for the wild population is critical to the survival of the species. Habitat critical to the survival of the species includes the area of occupancy of the population; areas of similar habitat surrounding the population (i.e. sandy rises among salt lakes), these areas provide potential habitat for natural range extension and/or for pollinators or biota essential to the continued existence of the species to feed and mate; and additional occurrences of similar habitat that may contain important populations of the species or be suitable sites for future translocations or other recovery actions intended to create important populations.

Benefits to other species or ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Caladenia melanema* will also improve the status of associated native vegetation. There is no other threatened flora in the immediate area, however there is one species, *Roycea pycnophylloides,* that occurs nearby. There are three Priority flora species located near *Caladenia melanema*.

Conservation-listed flora species occurring in habitat of *Caladenia melanema*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act 1999)
Roycea pycnophylloides	DRF - Vulnerable	Endangered
Pimelea pelinos	Priority 1	-
Astartea clavifolia	Priority 2	-
Eremophila veneta	Priority 4	Endangered

DRF – Declared Rare Flora; for a description of the Priority categories see Atkins (2006)

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 melanema* is not listed under any specific international treaty however, and therefore this IRP does not affect Australia's obligations under any other international agreements.

Indigenous Consultation: Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Caladenia melanema*, or groups with a cultural connection to land that is important for the species' conservation and to determine whether there are any issues or interests identified in the plan. A search of the Department

of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. Where no role is identified for the indigenous community in the development of the recovery plan for this species, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

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 IRP is unlikely to cause significant adverse social and economic impact.

Affected interests: The only stakeholder potentially affected by the implementation of this plan is the Shire of Kent when conducting road maintenance.

Evaluation of the plan's performance: DEC in conjunction with the Great Southern District Threatened Flora Recovery Team (GSDTFRT) 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. The Shire of Kent has been made aware of the threatened nature of this species, its location and their legal obligations to protect it.
2. Declared Rare Flora (DRF) markers have been installed at Population 1.
3. In 2004, seed was collected and stored at the Botanic Gardens and Parks authority (BGPA).
4. In 2004, tissue samples were collected from plants to isolate the fungal symbiont.
5. In 2000 and 2001, surveys were undertaken for *Caladenia melanema* by DEC staff and members of the WA Native Orchid Study and Conservation Group (WANOSCG).
6. The GSDTFRT is overseeing the implementation of this IRP and will include it in its annual report to DEC's Corporate Executive and funding bodies.
7. Staff from DEC's Great Southern District are monitoring the known Population.

IRP objective: The objective of this IRP is to abate identified threats and maintain or enhance the viable *in situ* population 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 the known population have increased by twenty five percent or more over the term of the plan.

Criteria for failure: The number of mature individuals in the known population have decreased by twenty five percent or more over the term of the plan.

Recovery actions

1. Coordinate recovery actions
2. Liaise with relevant land managers
3. Monitor populations
4. Collect seed and other material to preserve genetic diversity
5. Obtain biological and ecological information
6. Undertake weed control and follow-up with regular monitoring and additional control if required
7. Promote awareness
8. Conduct further surveys
9. Develop and implement a fire management strategy
10. Prepare a translocation proposal
11. Map habitat critical to the survival of *Caladenia melanema*
12. Review the need for further recovery actions

1. BACKGROUND

History

Caladenia melanema was first collected from its current location near Lake Altham by Steve Hopper in September 1985 and has since been collected from the same area on a further three occasions (FloraBase 2007). The species was formally described in 2001 (Hopper and Brown, 2001). Historically, *Caladenia melanema* has only ever been collected from the type locality. However, it is likely that habitat that may have been previously occupied by the species was destroyed during clearing for agriculture.

In 2000, Bill Jackson from the WA Native Orchid Study and Conservation Group (WANOSCG) spent two days searching for new populations of *Caladenia melanema* without success. Other members of WANOSCG have also surveyed in suitable habitat within Lake Chinocup Nature Reserve and around other lakes elsewhere without success. In 2001, surveys for the taxon were undertaken along roadsides and reserves near the known population by consultant botanists with the former Department of Conservation and Land Management (CALM) with no new populations being found. In 2005, Andrew Brown from CALM surveyed for new populations with no success.

Caladenia melanema is currently known from one population (two subpopulations) totaling 33 mature plants in the southern Wheatbelt of Western Australia.

Description

Caladenia melanema is an erect tuberous, perennial 8 to 15 cm high, occurring as solitary individuals or in small, clumps. Plants have a single slender, erect, pale green, densely hairy leaf, 4 to 12 cm long and 2 to 7 mm wide. The one or two flowers are 4 to 6 cm long and 4 to 5 cm wide with cream petals and sepals, sometimes with a dark maroon vein down their centre. Petals and sepals have tiny, dark red-black globular hairs on the outer two thirds, giving them a reddish-black tinge. The labellum, which is white to cream with numerous broken lines and red-maroon blotches, has two narrow rows of cream calli and curls under at the tip. Flowers have a strong smell similar to the odour of burning metal. Seed capsules dehisce to release numerous, small (pepper-like) seeds through slits in the side when mature (Louden, 2006).

Three related species (*Caladenia bicalliata*, *C. evanescens* and *C. abbreviata*) are similar to *C. melanema* in having abbreviated petals and sepals, but grow in coastal, rather than inland areas. *C. melanema* is also unique in having hemispherical glandular hairs on its petals and sepals, rather than the more normal cylindrical hairs found on these other species. The only other related taxon that grows near to *C. melanema* is *C. dimidia*, but it differs in having longer petals and sepals (to 8 cm) with cylindrical, not hemispherical glandular hairs (Hopper and Brown, 2001).

Distribution and habitat

Caladenia melanema is a highly restricted species that is found on a single sandy rise above saline flats near Pingrup in the southern Wheatbelt of Western Australia. Habitat is *Eucalyptus spathulata* and *Melaleuca* over scattered low shrubs. Species associated with *Caladenia melanema* include *Melaleuca lateriflora*, *M. hamulosa*, *M. uncinata*, *Santalum acuminatum*, *Trachymene pilosa*, *Dodonaea viscosa* and *Lycium australe*. The orchid tends to occur on the shaded southern side of shrubs with lichen and moss.

Summary of population land vesting, purpose and management

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1a. NW of Pingrup (Nature Reserve)	Great Southern	Kent	Conservation Commission of Western Australia	Conservation of Flora and Fauna	DEC
1b. NW of Pingrup	Great Southern	Kent	Unvested Reserve	Road reserve	Shire of Kent

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

Biology and ecology

Caladenia melanema resprouts annually from an underground tuber and is likely to be a long lived species.

The species does not require fire to stimulate flowering and if plants are burnt while in an active growing state they are likely to be killed.

Flowering occurs between August and September. Immature fruit has been recorded in September and October.

Threats

Caladenia melanema was declared as Rare Flora in 2004 under the Western Australian *Wildlife Conservation Act 1950* and is currently ranked as Critically Endangered (CR) under World Conservation Union (IUCN, 2001) Red List criteria B2ab(iii); C2a(ii), due to the species area of occupancy being less than 10 km^2 with total population size numbering fewer than 250 mature individuals with no subpopulation containing more than 50 mature individuals and a continuing decline in the area extent and quality of habitat. The species is not listed under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats are road maintenance, grazing, salinity, weed invasion, inappropriate fire regimes and small population size.

- **Road maintenance**. Subpopulation 1b is threatened by grading of road verges. Relevant authorities have been informed of the location of the species so that appropriate protective actions can be implemented.
- **Grazing** by kangaroos and rabbits threatens plants in Population 1. Plants have been recorded with whole flowers or parts of flowers grazed and with leaves grazed.
- **Salinity** is a potential threat to Population 1 as some plants occur within 10 metres of salt flats surrounding Lake Altham.
- **Weed invasion.** Weed species recorded within the vicinity of *Caladenia melanema* include smooth catsear (*Hypochaeris glabra*). Weeds compete for resources, reducing the health of *Caladenia melanema* plants, and reducing fecundity and recruitment.
- **Inappropriate fire regimes.** Adult plants may be killed by fire during their active growing phase when they replace tubers.
- **Small population size.** As *Caladenia melanema* is known from a single population, the likelihood of the species falling victim to chance demographic or environmental events is increased. A limitation on genetic diversity through a small number of plants may also cause longer term impacts on the health of the species.

The intent of this plan is to provide actions that will deal with immediate threats to *Caladenia melanema*. Although climate change may have a long-term effect on the species, actions taken directly to prevent the impact of climate change are beyond the scope of this plan.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Current Condition	Threats
1a. NW of Pingrup	Nature Reserve	1994 80 2000 14 2001 30 2003 62* 2004 300 2006 30	Healthy - Moderate	Grazing, weed invasion, salinity
1b. NW of Pingrup	Road Reserve	2000 8 2003 62* 2006 3	Healthy	Road maintenance, salinity

Populations in **bold text** are considered to be important populations; Note: * = total for both subpopulations.

Guide for decision-makers

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

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

Given that *Caladenia melanema* is ranked as CR, it is considered that all known habitat for the wild population is critical to the survival of the species, and that the wild population is an important population. Habitat critical to the survival of the orchid includes the area of occupancy of the single known population; areas of similar habitat surrounding the population (i.e. sandy rises among salt lakes), these areas provide potential habitat for natural range extension and habitat for pollinators essential to the continued existence of the species; and additional occurrences of similar habitat that may contain other populations of the species or be suitable sites for future translocations; and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Benefits to other species or ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Caladenia melanema* will also improve the status of associated native vegetation dominated by *Eucalyptus spathulata, Melaleuca lateriflora, Melaleuca hamulosa, Melaleuca uncinata, Santalum acuminatum, Trachymene pilosa, Dodonaea viscosa* and *Lycium australe*. There are no other threatened flora species located with *Caladenia melanema*, however, there is one species that grows nearby (*Roycea pycnophylloides*) and two Priority flora species grow in same general area. These species are listed in the table below.

Conservation-listed flora species occurring in habitat of *Caladenia melanema*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act, 1999)
Roycea pycnophylloides	DRF - Vulnerable	Endangered
Pimelea pelinos	Priority 1	-
Astartea clavifolia	Priority 2	-
Eremophila veneta	Priority 4	Endangered

DRF – Declared Rare Flora; For a description of the Priority categories see Atkins (2005).

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 melanema* is not listed under any specific international treaty however, and therefore this IRP does not affect Australia's obligations under any other international agreements.

Indigenous Consultation

Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Caladenia melanema*, or groups with a cultural connection to land that is important for the species' conservation and to determine whether there are any issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. Where no role is identified for the indigenous community in the development of the recovery plan for this species, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

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 IRP is unlikely to cause significant adverse social and economic impacts.

Affected interests

The Shire of Kent is potentially affected by the implementation of this plan as it manages the road reserve habitat of Subpopulation 1b.

Evaluation of the plan's performance

DEC, in conjunction with the Great Southern District Threatened Flora Recovery Team (GSDTFRT) 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

Objective

The objective of this IRP is to abate identified threats and maintain or enhance the *in situ* population 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 the known population have increased by twenty five percent or more over the term of the plan.
Criteria for failure: The number of mature individuals in the known population have decreased by twenty five percent or more over the term of the plan.

3. RECOVERY ACTIONS

Existing recovery actions

The Shire of Kent has been made aware of the threatened nature of this species, its location and their legal obligations to protect it.

Declared Rare Flora (DRF) markers have been installed at Population 1.

In 2004, seed was collected and stored with the Botanic Gardens and Parks Authority (BGPA). Tissue samples were also collected to isolate the fungal symbiont.

The GSDTFRT is overseeing the implementation of this IRP and will include it in its annual report to DEC's Corporate Executive and funding bodies.

Staff members from DEC's Great Southern District are monitoring the population.

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 of the priorities if funding is available for 'lower' priorities and other opportunities arise.

1. Coordinate recovery actions

The Great Southern District Threatened Flora Recovery team (GSDTFRT) is coordinating recovery actions for *Caladenia melanema* and other Declared Rare Flora in the District. Information on progress is included in their annual report to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: GSDTFRT
Cost: $1,400 annually.

2. Liaise with relevant land managers

Staff from DEC's Great Southern District will liaise with land managers to ensure that the population is not accidentaly damaged or destroyed. Input and involvement will also be sought from Indigenous groups that have an active interest in areas that are habitat for *Caladenia melanema*.

Action: Liaise with relevant land managers
Responsibility: DEC (Great Southern District) through GSDTRFT
Cost: $600 annually.

3. Monitor populations

Annual monitoring of factors such as habitat degradation, population expansion or decline, pollination activity, seed production, recruitment, longevity and predation is essential.

Action: Monitor populations
Responsibility: DEC (Great Southern District) through GSDTFRT
Cost: $600 annually.

4. Collect seed and other material to preserve genetic diversity

The Botanic Gardens and Parks Authority (BGPA) holds some seed of *Caladenia melanema* in storage. Preservation of genetic material is essential to guard against extinction of the species if the wild population is lost and it is recommended that further seed be collected. Collections should aim to sample and preserve the maximum range of genetic diversity possible (which should be determined by an appropriate molecular technique such as genetic fingerprinting if feasible). The "Germplasm Conservation Guidelines for Australia" produced by the Australian Network for Plant Conservation (ANPC) should be used to guide this process.

Action: Collect seed and other material to preserve genetic diversity
Responsibility: DEC (Great Southern District) and BGPA through GSDTFRT
Cost: $3,200 in years 1, 3 and 5.

5. Obtain biological and ecological information

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

1. Identification of the fungal symbiont associated with *Caladenia melanema.*
2. Investigation into the species' pollination biology and identification of pollinators.
3. Investigation of seed longevity and viability.
4. Investigation of conditions necessary for germination.
5. Investigation into the species response to disturbance such as fire.
6. Longevity of plants, and time taken to reach maturity.
7. Appropriate herbicides for weed control that will not adversely affect *Caladenia melanema.*

Actions: Obtain biological and ecological information
Responsibility: DEC (Science Division, TFSC, Great Southern District), BGPA through the GSDTFRT
Cost: $13,000 annually in years 1 to 3 and $18,000 in year 4.

6. Undertake weed control and follow up with regular monitoring and additional control if required

Weeds such as smooth catsear (*Hypochaeris glabra*) are a threat to the population of *Caladenia melanema*. The following actions will be implemented:

1. Select an appropriate herbicide after determining which weeds are present.
2. Control invasive weeds by hand removal or spot spraying around *Caladenia melanema* plants when weeds first emerge.
3. Schedule 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 *Caladenia melanema* is not known and weed control programs will be undertaken in conjunction with research.

Action: Undertake weed control and follow up with regular monitoring of impact on target weeds, *Caladenia melanema* and associated native vegetation, and implement additional control if required
Responsibility: DEC (Great Southern Districts) through the GSDTFRT
Cost: $1,800 annually.

7. Promote awareness

The importance of biodiversity conservation and the protection of *Caladenia melanema* will be promoted to the public. This will be achieved through an information campaign using local print and electronic media and by setting up poster displays. An A4 sized information sheet that provides a description of the species and information about threats and recovery actions will be developed for *C. melanema* and distributed to local land owners, relevant authorities and volunteer organisations, libraries and schools. It is hoped that the poster will result in the discovery of new populations. Formal links with local naturalist groups and interested individuals should also be encouraged.

To minimize the risk of accidental or deliberate destruction, it is recommended that the exact location of *Caladenia melanema* be kept from the general public. Such information should, however, be given to relevant landowners, Shire staff and government authorities with a management interest in the area.

Action: Promote awareness
Responsibility: DEC (Great Southern District, SCB and Strategic Development and Corporate Affairs Division) through the GSDTFRT
Cost: $1,600 in year 1 and $1,000 in years 2 to 5.

8. Conduct further surveys

Further surveys, with assistance from local naturalists, community volunteers, wildflower societies and naturalists clubs, should be conducted for additional populations of *Caladenia melanema* during the species flowering period between August and September.

Action: Conduct further surveys
Responsibility: DEC (Great Southern District) through GSDTFRT
Cost: $3,500 in years 1, 3 and 5.

9. Develop and implement a fire management strategy

Caladenia melanema is thought to be killed by fire if it occurs while the plant is in active growth. It is important therefore that a fire regime with appropriate fire frequency, intensity and seasonality be applied to areas occupied by the species to maximize population size and health and minimize damage. This will be addressed under this action.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Great Southern District) through the GSDTFRT, and relevant authorities.
Cost: $2,900 in year 1 and $1,700 in years 2 to 5.

10. Prepare a translocation proposal

Although *Caladenia melanema* occurs within a Nature Reserve, its restricted distribution makes the species particularly vulnerable to fire, disease or localized clearing. It is therefore recommended that a translocation proposal for the species be prepared.

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.

Action: Prepare a translocation proposal
Responsibility: DEC (Great Southern District) through the GSDTFRT
Cost: $2,800 in year 2.

11. Map habitat critical to the survival of *Caladenia melanema*

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

Action: Map habitat critical to the survival of *Caladenia melanema*
Responsibility: DEC (Great Southern District) through GSDTFRT
Cost: $3,100 in year 1.

12. Review the need for further recovery actions

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

Action: Review the need for further recovery actions
Responsibility: DEC (SCB, Great Southern District) through GSDTFRT
Cost: $1,500 in year 5.

Summary of recovery actions

Recovery Action	Priority	Responsibility	Completion date
Coordinate recovery actions	High	GSDTFRT	Ongoing
Liaise with relevant land managers	High	DEC (Great Southern District) through GSDTRFT	Ongoing
Monitor populations	High	DEC (Great Southern District) through GSDTFRT	Ongoing
Collect seed and other material to preserve genetic diversity	High	DEC (Great Southern District) and BGPA through GSDTFRT	Ongoing
Obtain biological and ecological information	High	DEC (Science Division, TFSC, Great Southern District), BGPA through the GSDTFRT	2011
Undertake weed control and follow-up with regular monitoring and additional control if required	High	DEC (Great Southern Districts) through the GSDTFRT	Ongoing
Promote awareness	High	DEC (Great Southern District, SCB and Strategic Development and Corporate Affairs Division) through the GSDTFRT	Ongoing
Conduct further surveys	High	DEC (Great Southern District) through GSDTFRT	Ongoing
Develop and implement a fire management strategy	High	DEC (Great Southern District) through the GSDTFRT, and relevant authorities	Developed by 2008 with implementation ongoing
Prepare a translocation proposal	High	DEC (Great Southern District) through the GSDTFRT	2009
Map habitat critical to the survival of *Caladenia melanema*	Moderate	DEC (Great Southern District, Species and Communities Branch (SCB)) through GSDTFRT	2008
Review the need for further recovery actions	Moderate	DEC (SCB, Great Southern District) through GSDTFRT	2012

4. TERM OF PLAN

This IRP will operate from April 2007 to March 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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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): 248-9, Figs 59, 60 (map).

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6. TAXONOMIC DESCRIPTION

Excerpt from: 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)**: 248-9.

Plant solitary or in clumps. *Leaf* erect, linear, 4-12 cm x 2-7 mm, pale green, basal third usually irregularly blotched with red-purple. *Scape* 8-15 cm tall. *Flowers* 1 or 2, approx. 4-5 cm across cream to pale yellow (rarely suffused pink or dark red) with dark maroon lines, spots and blotches; floral odour strong, like burning metal. *Sepals* and petals stiffly held, linear-lanceolate in basal quarter, then abruptly narrowing to a dark red-brown densely glandular long-acuminate filamentous apex lacking a tumescent osmophore; glandular hairs hemispherical. *Dorsal sepal* erect and slightly incurved, 2-4.5 cm x 1.5-2.5 mm. *Lateral sepals* spreading to downcurved, 2-4.5 cm x 1.5-3 mm. *Petals* spreading to downcurved, 2-3 cm x 1.5-3 mm. *Labellum* cream with thick red-maroon radiating basal lines becoming large irregular spots and blotches towards the recurved apex, stiffly articulate on a claw approx. 1 mm wide; lamina linear-rhomboidal in outline when flattened, 8-11 x 6-8 mm, obscurely 3-lobed, erect with entire margins in basal third, nearly horizontal in middle third, apical third sharply recurved, margins at widest point moderately curved upwards and terminated by obliquely ascending, distal margins dentate-serrate with white-tipped broad truncate marginal calli decrescent towards the apex. *Lamina calli* in 8-12 pairs in 2 rows extending at least half the length of the labellum, cream occasionally with a maroon apex, anvil-shaped, the longest approx. 1 mm tall, decrescent distally. *Column* 9-10 x 3-4 mm, narrowly

winged, creamy yellow with red blotches, sparsely hirsute with dark glandular trichomes especially on the central ridge. *Anther* approx. 1.5 x 1.5 mm, yellow or greenish-yellow. *Pollinia* approx. 1 mm long, yellow. Stigma approx. 1.5 mm wide. *Capsule* not seen.

Caladenia bicalliata, *C. evanescens* and *C. abbreviata* are all similar to *C. melanema* in having abbreviated petals and sepals, but all are coastal species, whereas *C. melanema* occurs well inland on salt lake margins. *C. melanema* is unique in the *C. filamentosa* complex in its glandular hairs on the petals and sepals usually being hemispherical rather than cylindrical. The only other taxon of the complex that grows near to *C. melanema* is *C. dimidia*, but this differs in its longer petals and sepals (to 8 cm) with cylindrical, not hemispherical glandular hairs, and its variable colouration.