Government of **Western Australia**
Department of **Environment and Conservation**

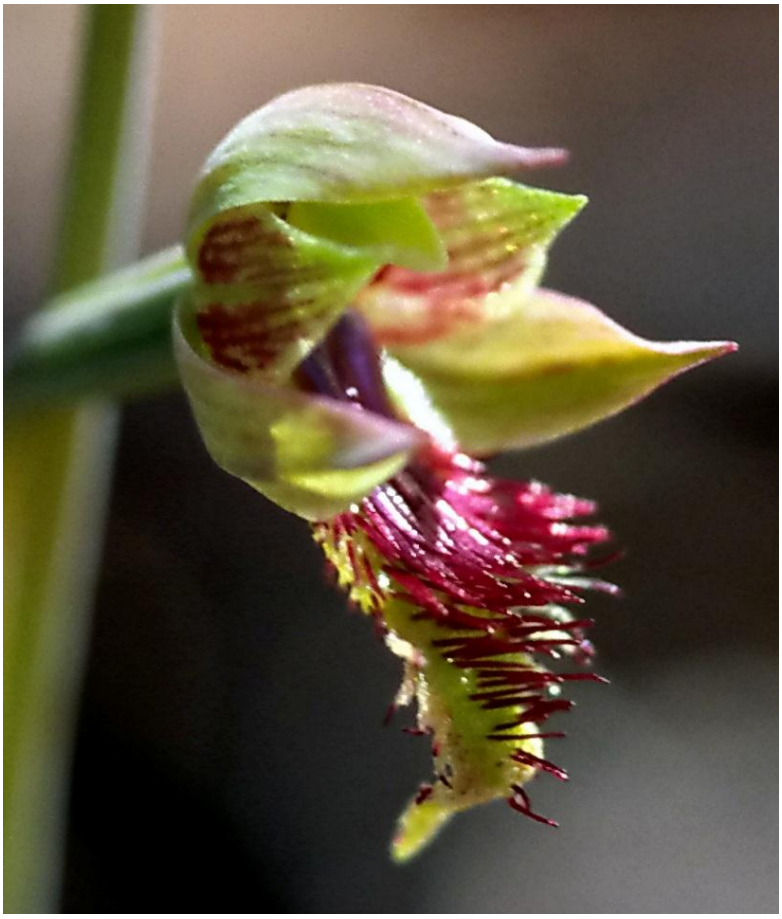
INTERIM RECOVERY PLAN NO. 337

HOPETOUN BEARD ORCHID

(*Calochilus pruinosus*)

INTERIM RECOVERY PLAN

2013–2018



April 2013
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. DEC will continue to adhere to these Policy Statements until they are revised and reissued.

Plans 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 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 taxa, always within one year of endorsement of that rank by the Minister.

This plan will operate from April 2013 to March 2018 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked as Critically Endangered in WA, this plan will be reviewed after five years and the need for further recovery actions assessed.

This plan was given regional approval on 27 March 2013 and was approved by the Director of Nature Conservation on 10 April 2013. The provision of funds identified in this plan is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this plan was accurate at April 2013.

PLAN PREPARATION

This plan was prepared by Robyn Luu[1] and Andrew Brown[2].

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ACKNOWLEDGMENTS

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

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Bob Bates	Co-curator of Orchidaceae, Adelaide Herbarium
Merle Bennett	Local resident, Hopetoun
Belinda Newman	Research Scientist, Botanic Gardens and Parks Authority
Ryan Phillips	PhD Candidate, Botanic Gardens and Parks Authority
Mia Podesta	Ecologist – TEC database, DEC Species and Communities Branch
Amanda Shade	Assistant Curator (Nursery), Botanic Gardens and Parks Authority
John Tucker	Local Resident, Hopetoun
Deon Utber	Regional Leader Nature Conservation, DEC South Coast Region

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information.

Cover photograph by Andrew Brown.

CITATION

This plan should be cited as: Department of Environment and Conservation (2012) Hopetoun Beard Orchid (*Calochilus pruinosus*) Interim Recovery Plan 2013–2018. Interim Recovery Plan No. 337. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific name:	***Calochilus pruinosus***	**Common name:**	Hopetoun Beard Orchid
Family:	Orchidaceae	**Flowering period:**	August (late) to October (early)
DEC region:	South Coast	**DEC districts:**	Albany, Esperance
Shire:	Plantagenet**,** Ravensthorpe, Dundas	**NRM region:**	South Coast
Recovery team:	Albany and Esperance District Threatened Flora and Communities Recovery Teams (ADTFCRT, EDTFRCT)	**IBRA region:**	Mallee, Esperance Plains

Distribution and habitat: In Western Australia, populations of *Calochilus pruinosus* have been located in mallee shrubland and woodland south of the Stirling Range, near Hopetoun and near Eyre. It is usually found on old consolidated dunes, often in the litter area of trees. It has also been more rarely recorded as growing among shrubs in tall shrubland (Jones 2006). The species grows in deep, well drained light brown sands. There is also a single record from South Australia which considered a self pollinating, leafless form of the Eastern Australian *Calochilus cupreus* (Bob Bates pers. comm.)

Habitat critical to the survival of the species, and important populations: *Calochilus pruinosus* is ranked in WA as CR, and as such it is considered that all known habitat for the wild population is habitat critical to the survival of the species, and that the wild population is an important population. Habitat critical to the survival of *C. pruinosus* includes the area of occupancy of populations, areas of similar habitat surrounding and linking populations (these providing potential habitat for population expansion and for pollinators), additional occurrences of similar habitat that may contain undiscovered populations of the species or be suitable for future translocations, and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Conservation status: *Calochilus pruinosus* is declared as rare flora (DRF) in WA under the Western Australian *Wildlife Conservation Act 1950* and is ranked as Critically Endangered (CR) under International Union for Conservation of Nature (IUCN 2001) Red List criteria B2ab(iii,iv,v); C2a(ii); D. The extent of the known extant population in Hopetoun is approximately 1.5km^2. The current area of occupancy is approximately 10 hectares. The species is not listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).

Threats: The main threats to the species are road, track and firebreak maintenance, weed invasion, inappropriate fire regimes, clearing, small population size, poor recruitment, motorbike riders, trampling and future mining operations.

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

1. Stakeholders have been made aware of the existence of this species and its locations.
2. Seed collected at the end of November 2007 is stored at the BGPA.
3. Surveys have been undertaken from 1982 until present by DEC staff, volunteers and members of the WA Native Orchid Study and Conservation Group (WANOSCG). These included all known habitat near Hopetoun and adjacent areas of similar habitat.
4. Declared Rare Flora (DRF) markers have been installed at road verge subpopulations.
5. In 1992, the Fitzgerald River National Park Association acquired a grant from the Gordon Reid Foundation to search in the park and near Hopetoun for *Calochilus pruinosus*.
6. A flyer was developed with the assistance of a recovery team member and distributed in 2010. The flyer asked people to report occurrences and if Hopetoun residents wished to adopt the species as its floral emblem.
7. Staff from the DEC's Albany District, in conjunction with local volunteers, regularly monitor the extant population at Hopetoun.
8. The ADTFCRT and EDTFCRTs are assisting DEC to coordinate recovery actions along with other threatened species in the Region. Information on progress in implementing recovery actions is included in annual reports to DEC's Corporate Executive and funding bodies.

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

Criteria for success
1. The number of extant populations has increased from one population to two or more over the term of the plan and/or
2. the number of mature individuals has increased by 100 per cent or more over the term of the plan from nine plants to 18 or more.

Criteria for failure
1. The number of mature individuals has decreased by 33 per cent or more over the term of the plan from nine plants to six or less.

Recovery actions

1. Coordinate recovery actions
2. Ensure long term protection of habitat
3. Deter access to Hopetoun population
4. Install DRF markers
5. Conduct weed control
6. Undertake surveys
7. Monitor populations
8. Develop and implement a fire management strategy
9. Collect and store seed
10. Formalise taxonomy
11. Obtain biological and ecological information
12. Develop and implement a translocation proposal
13. Liaise with land managers and Indigenous groups
14. Nominate *Calochilus pruinosus* for listing under the Commonwealth EPBC Act
15. Map habitat critical to the survival of *Calochilus pruinosus*
16. Promote awareness
17. Review this plan and assess the need for further recovery actions

1. BACKGROUND

History

Calochilus pruinosus was first recognised as a distinct species by Noel Hoffman and Andrew Brown in 1992 when they provided it with the phrase name *C.* sp. Hopetoun. It was formally named by David Jones in 2006.

The first collection of *Calochilus pruinosus* was made from south of the Stirling Range by B. Hall in 1983 and is housed at the Albany Museum. Further plants were found at this site in 1994 and 1995 but it has not been seen there since. Historically, the species is known from three disjunct locations in WA – south of the Stirling Range, the Hopetoun area where it was located in 1988, and near Eyre Bird Observatory (south-east of Cocklebiddy) where it was located in 1994. Despite numerous searches of these and other sites, the species is currently known from one extant population near Hopetoun, consisting of approximately nine individuals in 2009.

Plants of a taxon that is similar in appearance to *Calochilus pruinosus* have been found in eastern South Australia close to the Victorian border. However, this taxon is now considered to be a self pollinating, leafless form of the Eastern Australian *Calochilus cupreus* (Bob Bates pers. comm.).

Description

Jones (2006) characterises *Calochilus pruinosus* as being pinkish-green to pinkish-brown, pruinose (white powdery coating); leaf absent, replaced by a basal sheathing bract; flowers small (14-19mm long); perianth segments not spreading widely; very sparse labellum calli; short marginal lobes on the labellum (1-2mm long), those in the proximal half purple and non-glandular, those in the distal half short, green and glandular; a short, relatively broad labellum apex (1.5-2.5mm x 1.5mm); and column with enlarged basal lobes. The species name is derived from the Latin *pruinosus*, which means to be covered with a waxy or powdery bloom (Jones 2006).

Illustrations and/or further information

Brown, A., Dundas, P., Dixon, K. and Hopper, S. (2008) Orchids of Western Australia. University of Western Australia Press, Crawley, Western Australia; Jones, D.L. (2006) Miscellaneous new species of Australian Orchidaceae. *Australian Orchid Research* 5: 67-68; Western Australian Herbarium (1998−) *FloraBase − The Western Australian Flora*. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/.

Distribution and habitat

In Western Australia, *Calochilus pruinosus* has been found in mallee shrubland and woodland in three disjunct locations – south of the Stirling Range, near Hopetoun and near Eyre. It usually occupies old consolidated dunes, often in the litter area of trees. It has also been more rarely recorded as growing among shrubs in tall shrubland (Jones 2006). The species grows in deep, well drained light brown sands. Associated species include *Eucalyptus* aff. *falcata*, *E. angulosa*, *Acacia cyclops*, *Calothamnus quadrifidus*, *Pomaderris myrtilloides*, *Acrotriche cordata* and *Desmocladus flexuosus*.

Table 1. Summary of population land vesting, purpose and manager

Pop. no. & location	DEC district	Shire	Vesting	Purpose	Manager
1A. E of Hopetoun	Albany	Ravensthorpe	Non vested	Unallocated Crown Land	Department of Planning
1B. E of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Shire of Ravensthorpe
1D. E of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Shire of Ravensthorpe
1E. E of Hopetoun	Albany	Ravensthorpe	Non vested	Unallocated Crown Land	Department of Planning
1F. E of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Shire of Ravensthorpe
1H. E of Hopetoun	Albany	Ravensthorpe	Non vested	Unallocated Crown Land	Department of Planning
1J. N of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Main Roads WA

1K. SE of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Parkland and recreation	Shire of Ravensthorpe
1L. SE of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Parkland and recreation	Shire of Ravensthorpe
1M. SE of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Shire of Ravensthorpe
1N. E of Hopetoun	Albany	Ravensthorpe	Non vested	Unallocated Crown Land	Department of Planning
1O. SE of Hopetoun	Albany	Ravensthorpe	Unvested reserve	Road reserve	Shire of Ravensthorpe
2. S of the Stirling Range	Albany	Albany	Unknown	Unknown	Unknown
3. Eyre	Esperance	Dundas	Non vested	Unallocated Crown Land	Shire of Dundas

Biology and ecology

Calochilus species have flowers that emit pheromones, mimicking those used by female scollid wasps (*Campsomeris*) to attract males of the same species. The flower is mistaken for a female wasp and in its attempt to mate with the labellum the male wasp inadvertently deposits or removes pollen. A male scollid wasp has been photographed attempting to mate with the labellum of *Calochilus pruinosus.*

All *Calochilus* species undergo self-pollination if insect pollination does not occur. All species rely on seed for reproduction.

Germination is not triggered by fire but does require the presence of specialist soil mycorrhizal fungi (Brown *et al*. 2008).

Conservation status

Calochilus pruinosus is declared as rare flora (DRF) in WA under the Western Australian *Wildlife Conservation Act 1950* and is ranked as Critically Endangered (CR) under International Union for Conservation of Nature (IUCN 2001) Red List criteria B2ab(iii,iv,v); C2a(ii); D. due to its area of occupancy being less than 10km^2; a single extant population known in WA; a continuing decline in area, extent and quality of habitat and the number of mature individuals; at least 90% of plants in one population and less than 50 currently known mature plants in the wild. The species is not listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).

Threats

The main threats to the species are:

- **Road, track and firebreak maintenance**. Threats include slashing, grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion.
- **Weed invasion.** The main weed species affecting *Calochilus pruinosus* is Bridal Creeper (*Asparagus asparagoides*). Weeds suppress early plant growth by competing for soil moisture, nutrients and light. They also increase the fire hazard due to the easy ignition of high fuel loads, which are produced annually by many grass weed species.
- **Altered fire regimes.** These may interfere with the reproductive phase of the orchid (flowering, pollination, seed growth and seed dispersal). Seedlings can be killed by inappropriate timing of fires in the first few years of growth. Due to the restricted distribution of the species and low numbers of plants it is thought that the extant population may be seriously impacted if burnt during the species' active growing period. Fire may also facilitate weed invasion and when it occurs should be followed up with appropriate weed control.
- **Clearing.** Future housing development is a threat to the population and negotiations will occur between the relevant parties to minimise impact. As the species is listed as DRF in WA no *Calochilus pruinosus* plants may be taken or damaged without Ministerial approval.
- **Small population size.** As *Calochilus pruinosus* is known from a single extant population in WA, the likelihood of the species declining due to chance demographic or environmental events is much increased.
- **Poor recruitment and declining populations.** In areas where many flowering plants were located during surveys in the early 1990s few plants were found during surveys in 2009 and 2010.
- **Motorbike riders**. The habitat has been highly dissected with tracks used by recreational motorbike riders.

- **Trampling.** The extant population is located in an area used by the general public and is therefore at risk of accidental trampling.
- **Future mining operations.** A mineral extraction lease covers the site and future mining has the potential to severely impact the habitat.

The intent of this plan is to provide actions that will deal with immediate threats to *Calochilus pruinosus*. 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.

Table 2. Summary of population information and threats

Pop. no. & location	Land status	Year / no. of plants	Condition of habitat	Threats
1a. E of Hopetoun	Unallocated Crown Land	1991 12 1991 6 1992 22 1995 10 1996 8 2007 14 2008 7 2009 2	Moderate	Weeds, firebreak maintenance, clearing, altered fire regimes, motorbike riders, trampling, small population size, poor recruitment
1b. E of Hopetoun	Shire road reserve	1991 3 1992 2 2007 5	Moderate	Road maintenance, altered fire regimes, firebreak maintenance, small population size, poor recruitment, motorbike riders, trampling,
1d. E of Hopetoun	Shire road reserve	1990 9 1991 4 1992 5 1995 1 2007 1	Moderate	Road maintenance, altered fire regimes, firebreak maintenance, motorbike riders, trampling small population size, poor recruitment
1e. E of Hopetoun	Unallocated Crown Land	2007 7	Moderate	Motorbike riders, firebreak maintenance, altered fire regimes, clearing, trampling, small population size, poor recruitment
1f. E of Hopetoun	Shire road reserve	1992 7 2007 1	Moderate	Road maintenance, altered fire regimes, small population size, poor recruitment
1h. E of Hopetoun	Unallocated Crown Land	2007 1	Moderate	Motorbike riders, altered fire regimes, firebreak maintenance clearing, trampling, small population size, poor recruitment
1j. N of Hopetoun	Main Roads WA road reserve	1992 4 2007 2	Moderate	Road maintenance, altered fire regimes, small population size, poor recruitment
1k. SE of Hopetoun	Shire reserve (parkland and recreation)	1991 3 1992 1 2008 2 2009 2	Moderate	Firebreak maintenance, altered fire regimes, clearing, small population size, trampling, motorbike riders, poor recruitment
1l. SE of Hopetoun	Shire reserve (parkland and recreation)	2009 1	Moderate	Firebreak maintenance, altered fire regimes, clearing, small population size, poor recruitment
1m. SE of Hopetoun	Shire road reserve	2009 1	Moderate	Road maintenance, altered fire regimes, small population size, poor recruitment
1n. E of Hopetoun	Unallocated Crown Land	2009 2	Moderate	Firebreak maintenance, trampling, altered fire regimes, motorbike riders, clearing, small population size, poor recruitment
1o. SE of Hopetoun	Shire road reserveRoad Reserve	2009 1	Moderate	Road maintenance, altered fire regimes,
2. S of the Stirling Range	Shire roadRoad reserve?	1983 1	Unknown	No plants have been seen since 1983
3. Eyre	Unallocated Crown Land	1998 2	Good	No plants have been seen since 1998

Note: Populations in **bold text** are considered to be important populations.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Actions for development and/or land clearing in the immediate vicinity of *Calochilus pruinosus* may require assessment.

Actions that could result in any of the following may potentially result in a significant impact on the species:

- Damage or destruction of occupied or potential habitat.
- Alteration of the local surface hydrology or drainage.
- Reduction in population size.
- A major increase in disturbance in the vicinity of a population.

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

Calochilus pruinosus is ranked in WA as CR, and as such it is considered that all known habitat for wild populations is habitat critical to their survival and that wild populations are important populations. Habitat critical to the survival of *C. pruinosus* includes the area of occupancy of populations (both extant and previously known populations), areas of similar habitat surrounding populations (these providing potential habitat for population expansion and for pollinators), additional occurrences of similar habitat that may contain undiscovered populations of the species or be suitable 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 *Calochilus pruinosus* will also improve the status of associated native vegetation. *Spyridium oligocephalum* (Priority 3) occurs within 500m of *C. pruinosus* (for a description of the Priority categories see Smith (2010)).

Calochilus pruinosus does not occur within or adjacent to any Threatened or Priority Ecological Communities (TECs/PECs).

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. The species is not listed under Appendix II in the United Nations Environment Program World Conservation Monitoring Centre (UNEP-WCMC) Convention on International Trade in Endangered Species (CITES), and this plan does not affect Australia's obligations under any other international agreements.

Indigenous consultation

A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register revealed no sites of Aboriginal significance adjacent to the population of *Calochilus pruinosus*. Input and involvement is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and Department of Indigenous Affairs to determine if there are any issues or interests. Indigenous opportunity for future involvement in the implementation of the Recovery plan is included as an action in the plan.

Social and economic impacts

The implementation of this plan may potentially cause some social and economic impacts. For plants occurring on UCL (Subpopulations 1A, 1E, 1H and 1N) through the loss of land available for development, as well as the cost of implementing recovery actions (weed control, deterring access). Populations that occur on UCL are subject to a mineral exploration lease. Although mining is not currently being implemented, there is potential for economic impact should operations commence. For subpopulations on land managed by the local Shire (Subpopulations 1B, 1D, 1F, 1K, 1L, 1M and 1O) and Main Roads WA (subpopulation 1J) social and economic impact may also occur through the loss of land available for development and the cost of implementing recovery actions (controlling weeds) and impacts on management operations. Several sub-populations may influence fire protection strategies for the Hopetoun townsite.

Affected interests

Shires, Main Roads WA, FESA and private landholders. The occurrence of populations on UCL subject to a mineral exploration lease will also have implications for Department of Mines and Petroleum and the mining tenement holders.

Evaluation of the plan's performance

DEC, with assistance from the Albany and Esperance District Threatened Flora and Communities Recovery Teams (ADTFCRT, EDTFCRT), will evaluate the performance of this plan. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

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

Criteria for success

1. The number of extant populations has increased from one population to two or more over the term of the plan and/or
2. the number of mature individuals has increased by 100 per cent or more over the term of the plan from nine plants to 18 or more.

Criteria for failure

1. The number of mature individuals has decreased by 33 per cent or more over the term of the plan from nine plants to six or less.

3. RECOVERY ACTIONS

Existing recovery actions

Stakeholders have been made aware of the existence of this species and its locations. These notifications detail the current status of the species as DRF and the associated legal obligations in regards to their protection.

Calochilus pruinosus seed was collected by Botanic Gardens and Parks Authority (BGPA) staff in November 2007. One or two capsules, equivalent to thousands of orchid seed, are currently stored in one cryovial (at approximately 0.10 mL) in the seed storage room at BGPA. This room has a constant temperature of 22 degrees and 15% humidity to prevent mould and spoil of the seeds. Long term plans for the seeds include cryostorage, whereby the orchid seeds can be stored for many decades (B. Newman pers. comm.).

Surveys have been undertaken by DEC staff, local volunteers and members of the WA Native Orchid Study and Conservation Group (WANOSCG) from 1982 until present. These surveys included suitable habitat near Hopetoun and adjacent areas of similar habitat. No new populations have been located.

Declared Rare Flora (DRF) markers have been installed at road verge and track subpopulations. These alert people working in the vicinity to the presence of DRF and the need to avoid work that may damage the species or its habitat. Dashboard stickers and posters describing the significance of DRF markers have been produced and distributed to relevant Shires and other organisations.

In 1992 the Fitzgerald River National Park Association acquired a grant from the Gordon Reid Foundation to search for *Calochilus pruinosus*. No new populations were located.

A flyer was developed with the assistance of a recovery team member and distributed in 2010. The flyer asked people to report occurrences and if Hopetoun residence wished to adopt the species as its floral emblem.

Staff from the DEC's Albany District and local volunteers regularly monitor the Hopetoun population.

The ADTFCRT and EDTFCRT are assisting DEC to coordinate recovery actions for *Calochilus pruinosus* along with other threatened species in the Region. Information on progress in implementing recovery actions will be reported through annual reports to DEC's Corporate Executive and funding bodies.

Future recovery actions

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

1. Coordinate recovery actions

The ADTFCRT and EDTFCRT will assist DEC in coordinating recovery actions for *Calochilus pruinosus* along with other threatened species. Information on progress in implementing recovery actions will be reported through annual reports to DEC's Corporate Executive and funding bodies.

Action:	Coordinate recovery actions
Responsibility:	DEC (Albany and Esperance Districts) with assistance from the ADTFCRT and EDTFCRT
Cost:	$6,000 per year

2. Ensure long-term protection of habitat

Where possible, DEC will seek to have land containing populations and subpopulations of the species declared as reserves for the purpose of conservation.

Action:	Ensure long-term protection of habitat
Responsibility:	DEC (Albany and Esperance Districts, Land Acquisition Branch); Department of Planning (DoP); Department of Mines and Petroleum (DMP)
Cost:	$3,000 per year

3. Deter access to the Hopetoun population

To deter access to the Hopetoun population barriers such as bollards or fencing may be needed. Signs indicating the significance of the area may also need to be introduced to prevent picking or trampling.

Action:	Deter access to the Hopetoun population
Responsibility:	DEC (Albany District), Shire of Ravensthorpe, Department of Planning
Cost:	$10,000 in year 1

4. Install DRF markers

DRF markers need to be maintained at several subpopulations at Hopetoun.

Action:	Install DRF markers
Responsibility:	DEC (Albany District), Shire of Ravensthorpe
Cost:	$1,500 in year 1

5. Conduct weed control in Hopetoun population

Weeds are a major threat to many subpopulations at Hopetoun. The following actions will be implemented:

- Determine which weeds are present and map them.
- Select appropriate control technique; herbicide, mowing or hand weeding.
- Control invasive weeds by hand removal and/or spot spraying around the *Calochilus pruinosus* plants when weeds first emerge.
- Revegetation with site specific species is required to maintain low weed levels.
- Monitor the success of the treatment on weed death, and the tolerance of *Calochilus pruinosus* and associated native plant species to the treatment.
- Report on the method and success of the treatment, and effect on *Calochilus pruinosus* plants and associated species.

Action: Conduct weed control in Hopetoun population
Responsibility: DEC (Albany District)
Cost: $6,000 per year, as required

6. Undertake surveys

It is recommended that areas of potential suitable habitat be surveyed for the presence of *Calochilus pruinosus*. All surveyed areas will be recorded and the presence or absence of the species documented to increase survey efficiency and reduce unnecessary duplicate surveys. Where possible, volunteers from the local community, Landcare groups, WANOSCG, wildflower societies and naturalists clubs will be encouraged to become involved.

Action: Undertake surveys
Responsibility: DEC (Albany and Esperance Districts)
Cost: $5,000 per year

7. Monitor populations

Monitoring of factors such as grazing, weed invasion, habitat degradation, hydrology, population stability (expansion or decline), pollinator activity, seed production, recruitment, and longevity is essential.

Action: Monitor populations
Responsibility: DEC (Albany and Esperance Districts)
Cost: $10,000 per year

8. Develop and implement a fire management strategy

Fire should be avoided during the species' active growing period. A fire management strategy will be developed in liaison with FESA and the Shire to ensure an appropriate fire regime for *Calochilus pruinosus* subpopulations whilst allowing for protection of the Hopetoun townsite from bushfires.. This strategy should incorporate other priority and threatened flora species in the area.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Albany and Esperance Districts)
Cost: $10,000 in year 1 and $2,000 in subsequent years

9. Collect and store seed

Seed will be collected and stored at the BGPA. 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).

Action: Collect and store seed
Responsibility: DEC (Albany District), BGPA
Cost: $5,000 per year

10. Formalise taxonomy

Plants of a taxon that is similar in appearance to *Calochilus pruinosus* have been found in eastern South Australia. However, it is now considered. However, this taxon is now considered to be a self pollinating, leafless form of the Eastern Australian *Calochilus cupreus*. This determination requires formalisation.

Action: Formalise taxonomy
Responsibility: DEC (Species and Communities Branch (SCB), Science Division, Albany and Esperance Districts) Adelaide Herbarium
Cost: $10,000 in year 1

11. Obtain biological and ecological information

Knowledge of the biology and ecology of the species will provide a scientific basis for management of *Calochilus pruinosus* in the wild. These investigations will include:

- Study of the soil seed bank dynamics and the role of various factors including disturbance, competition, drought, inundation and grazing in recruitment and seedling survival.
- Determination of reproductive strategies, phenology and seasonal growth.
- Investigation of reproductive success and pollination biology.
- Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.

Action: Biological and ecological information
Responsibility: DEC (Science Division, Albany and Esperance Districts), BGPA
Cost: $10,000 per year

12. Develop and implement a translocation proposal

Translocation may be deemed desirable for the conservation of this species if surveys fail to locate new populations. A translocation proposal will be developed, suitable translocation sites selected and a translocation implemented. Information on the translocation of threatened plants and animals in the wild is provided in DEC's Policy Statement No. 29 *Translocation of Threatened Flora and Fauna* (CALM 1995), and the Australian Network for Plant Conservation translocation guidelines (Vallee *et al*. 2004). All translocation proposals require endorsement by DEC's Director of Nature Conservation. Monitoring of translocations is essential and will be included in the timetable developed for the Translocation Proposal.

Action: Develop and implement a translocation proposal
Responsibility: DEC (Albany and Esperance Districts), BGPA
Cost: $5,000 in year 4

13. Liaise with land managers and Indigenous groups

Staff from DEC's Albany and Esperance Districts will liaise with land managers to ensure that the extant population and areas which contained previously known populations of *Calochilus pruinosus* are not accidentaly damaged or destroyed. Indigenous consultation will take place to determine if there are any issues or interests in areas that are habitat for *C. pruinosus*.

Action: Liaise with land managers and Indigenous groups
Responsibility: DEC (Albany and Esperance Districts)
Cost: $2,000 per year

14. Nominate *Calochilus pruinosus* for listing under the Commonwealth EPBC Act

Staff from DECs SCB will develop a Species Profile and Threats (SPRAT) and/or EPBC Act nomination for this species. The nomination will be forwarded to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities for referral to the Commonwealth Threatened Species Scientific Committee (TSSC) and Minister for the Environment for listing under the EPBC Act.

Action: Nominate *Calochilus pruinosus* for listing under the Commonwealth EPBC Act
Responsibility: DEC (SCB)
Cost: $3,000 in year 1

15. Map habitat critical to the survival of *Calochilus pruinosus*

Although habitat critical to the survival of the species is alluded to in Section 1, it has not yet been mapped and this will be addressed under this action. If additional populations are located, then habitat critical to their survival will also be determined and mapped.

Action: Map habitat critical to the survival of *Calochilus pruinosus*
Responsibility: DEC (SCB, Albany and Esperance Districts)
Cost: $6,000 in year 2

16. Promote awareness

The importance of biodiversity conservation and the protection of *Calochilus pruinosus* 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. Formal links with local naturalist groups and interested individuals will also be encouraged.

Action: Promote awareness
Responsibility: DEC (Albany and Esperance Districts, SCB, Strategic Development and Corporate Affairs Division) with assistance from the ADTFCRT and EDTFCRT
Cost: $4,000 in year 1 and $2,000 in years 2-5

17. Review this plan and assess the need for further recovery actions

If *Calochilus pruinosus* is still ranked CR at the end of the five-year term of this plan, the need for further recovery actions, or a review of this plan will be assessed and a revised plan prepared if necessary.

Action: Review this plan and assess the need for further recovery actions
Responsibility: DEC (SCB, Albany and Esperance Districts) with assistance from the ADTFCRT and EDTFCRT
Cost: $3,000 in year 5

Table 3. Summary of Recovery Actions

Recovery action	Priority	Responsibility	Completion date
Coordinate recovery actions	High	DEC (Albany District) with assistance from the ADTFCRT	Ongoing
Ensure long term protection of habitat	High	DEC (Albany District, Land Acquisition Branch); Department of Planning and Infrastructure (DPI); Department of Mines and Petroleum (DOMP)	Ongoing
Deter access to the Hopetoun populations	High	DEC (Albany District), Shire of Ravensthorpe, Department of Planning	2012
Install DRF markers	High	DEC (Albany District), Shire of Ravensthorpe	2012
Conduct weed control in Hopetoun population	High	DEC (Albany District)	Ongoing
Undertake surveys	High	DEC (Albany District)	Ongoing

Monitor populations	High	DEC (Albany District)	Ongoing
Develop and implement a fire management strategy	High	DEC (Albany District)	Developed by 2012 with implementation ongoing
Collect and store seed	High	DEC (Albany District), BGPA	2016
Clarify taxonomy	Medium	DEC (SCB, Science Division, Albany District), Adelaide Herbarium	2012
Biological and ecological information	High	DEC (Science Division, Albany District), BGPA	2016
Develop and implement a translocation proposal	Medium	DEC (Albany District), BGPA	2015
Liaise with land managers and Indigenous groups	Medium	DEC (Albany District)	Ongoing
Nominate *Calochilus pruinosus* for listing under the Commonwealth EPBC Act	Medium	DEC (SCB)	2012
Map habitat critical to the survival of *Calochilus pruinosus*	Medium	DEC (SCB, Albany District)	2013
Promote awareness	Medium	DEC (Albany District, SCB, Strategic Development and Corporate Affairs Division) with assistance from the ADTFCRT	Ongoing
Review this plan and assess the need for further recovery actions	Medium	DEC (SCB, Albany District) with assistance from the ADTFCRT	2016

4. TERM OF PLAN

This plan will operate from April 2013 to March 2018 but will remain in force until withdrawn or replaced. If the species is still ranked CR after five years, the need for further recovery actions will be determined.

5. REFERENCES

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6. TAXONOMIC DESCRIPTION

Calochilus pruinosus

Jones, D.L. (2006) Miscellaneous new species of Australian Orchidaceae. *Australian Orchid Research* 5: 67-68.

Plants overall greenish pink to pinkish brown, strongly pruinose. *Tubers* not seen. *Leaf* absent, replaced by a basal bract; basal bract ovate-lanceolate, 6-10cm long, 12-18mm wide, erect, closely sheathing except near the apex, fleshy; dorsal surface rounded to bluntly carinate; apex acute. *Inflorescence* 15-50cm long, slender. *Sterile bracts* 2 or 3, oblong-lanceolate, 4-7cm long, 6-11mm wide; base closely sheathing; apex free or sheathing, acuminate. *Fertile bracts* narrowly ovate-lanceolate, 8-30mm long, 4-6mm wide, closely sheathing, apex acuminate. *Pedicels* 6-12mm long, slender, curved. *Ovaries* obovoid, 5-7mm long, 3-4mm wide, green. *Buds* greenish pink to pinkish brown, pruinose. *Flowers* remaining cupped the segments not spreading widely, 1-15, 14-19mm long, 10-13mm across; sepals and petals greenish pink to greenish brown, marked with reddish lines; labellum calli reddish purple to brownish purple; marginal lobes green. *Dorsal sepal* oblong-ovate, 5-7mm long, 4-5.5mm wide, porrect to obliquely erect, concave; apex shortly apiculate. *Lateral sepals* oblong-obovate to oblong-elliptic, 8-10mm long, 3.5-4.5mm wide, porrect to incurved, rarely divergent, dorsally carinate; distil margins involute; apex shortly acuminate. *Petals* asymmetrically broadly ovate, 5-7mm long, 4-5.5mm wide, porrect to incurved; apex apiculate. *Labellum* decurved; lamina ovate-lanceolate, 10-14mm long, 5.5-6.5mm wide, c. 2mm wide at the base; margins often remaining incurved; apical portion narrowly deltate, 1.5-2.5mm long, c. 1.5mm wide, naked, tapered to a short, recurved, sinuous apex. *Labellum margins* cut into 11-15 pairs of simple, narrowly triangular lobes 1-2mm long, those in the proximal half purple and non-glandular, those in the distal half short, green and glandular, becoming shorter and more widely spaced distally. *Labellum dorsal surface* glandular along the distal margins and the apex. *Labellum calli* sparse, reddish-purple to brownish-purple, to 4mm long, non-glandular, porrect to decurved, in the proximal half reduced to 2-6 prominent, raised, shiny, dark purple plates, densely glandular. *Column* 5-6mm long, c. 3.5mm wide, green with a few reddish purple markings, the dorsal surface with a small cluster of granular excrescences; wings broad, the inner basal margin with a dark purple, eye-like gland, connected by an obscure reddish anterior ridge. *Anther* c. 3mm long, c. 3mm wide, green, obliquely erect. *Pollinia* c. 3.2mm long, curved. *Stigma* c. 2.5mm wide. *Capsules* obovoid to broadly obovoid, 10-16mm long, 6-8mm wide, erect, ribbed.