

INTERIM RECOVERY PLAN NO. 238

BLUE TINSEL LILLY

(Calectasia cyanea)

INTERIM RECOVERY PLAN

2007-2012



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

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

This IRP will operate from July 2007 to June 2012 but will remain in force until withdrawn or replaced.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 22nd November 2007 and was approved by the Director of Nature Conservation on 10th December 2007. The 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 July 2007.

IRP PREPARATION

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ACKNOWLEDGMENTS

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

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Andrew Crawford	Technical Officer, Threatened Flora Seed Centre, DEC
Amanda Shade	Assistant curator of displays and development, Botanic Gardens Parks Authority

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 photographs by C. Hortin. Image used with the permission of the Western Australian Herbarium, DEC (<http://florabase.calm.wa.gov.au/help/copyright>). Accessed October 2006.

CITATION

This IRP should be cited as:

Department of Environment and Conservation. (2007). Blue Tinsel Lilly (*Calectasia cyanea*) Interim Recovery Plan 2007-2012. Interim Recovery Plan No. 238 Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name	<i>Calectasia cyanea</i>	Common Name	Blue Tinsel Lilly, Cape Tinsel Lilly
Family	Calectasiaceae	Flowering Period	July – January
DEC Region	South Coast	DEC District	Albany
Shire	Albany	Recovery Team	Albany District Threatened Flora Recovery Team

Illustrations and/or further information: Barrett, R.L. and Dixon, K.W. (2001). A revision of the genus *Calectasia* (Calectasiaceae) with eight new species described from south-west Western Australia. *Nuytsia*. **13 (3)**: 411-448; DEC (2003 onwards) *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: *Calectasia cyanea* was declared as Rare Flora in 2003 under the Western Australian *Wildlife Conservation Act 1950* and was ranked at that time as Critically Endangered (CR) under the World Conservation Union (IUCN, 2001) Red List criteria C2a(i); D based on the species area of occupancy being less than 10 km² with all plants known from a single population containing fewer than 50 mature plants. Additional mature plants have since been found and the species no longer meets CR based on the above criteria. However, it is proposed that the ranking of *Calectasia cyanea* remain CR due to there being a single population that may be damaged or destroyed by a single event. The species is listed as CR under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats are inappropriate fire regimes, small population size and grazing.

Calectasia cyanea is confined to the south coast of Western Australia where it is known from a single population totalling approximately 100 mature plants over an area of occupancy of 0.02 km².

Description: *Calectasia cyanea* is an undershrub to 40 cm, with a few short lateral branches, usually with stilt roots. Leaves are 6.5 to 13 mm long by 1.0 to 1.3 mm wide, lack hairs, and have rough margins, the apex tapering to a sharp point. Bracts are 6.8 to 7.5 mm long by 1.6 to 2.3 mm wide, light green to pale brown in colour. Perianth tube is 6.5 by 8.0 mm long, with distinct hairs in the lower half to two thirds. The throat has a tangle of short hairs and the lobes are papery, 8.3 to 11.2 mm long by 2.1 to 3.3 mm wide, dark blue, fading to white with hairs on the underside. The anthers are 4.9 to 5.2 mm long, yellow, turning orange-red with age. The style is generally 9.5 mm long or occasionally to 12 mm long and exceeds the anthers.

Calectasia cyanea is most closely related to *C. gracilis* and *C. pignattiana* but differs in its clumping habit (due to vigorous basal sprouting). It also differs from *C. pignattiana* in its mature leaves that are not turned downwards.

Habitat requirements: *Calectasia cyanea* occurs on yellow sand or gravel over laterite in low heathland on a low ridge to gentle slope.

Habitat critical to the survival of the species, and important populations: Given that *Calectasia cyanea* 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 *C. cyanea* includes the area of occupancy of the population, areas of similar habitat surrounding the population (this is necessary to provide habitat for pollinators and future population expansion) and additional occurrences of similar habitat that may contain unrecorded populations of the species or be suitable for future translocations.

Benefits to other species or ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Calectasia cyanea* will also improve the status of associated native vegetation. No other threatened flora are located with *C. cyanea*, however four priority flora species are located with this species and are listed in the table below.

Conservation-listed flora species occurring in habitat of *Calectasia cyanea*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act 1999)
<i>Conospermum quadripetalum</i>	Priority 2	-
<i>Gyrostemon thesioides</i>	Priority 2	-
<i>Eucalyptus goniantha</i> subsp. <i>goniantha</i>	Priority 4	-
<i>Adenanthos cunninghamii</i>	Priority 4	-

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. *Calectasia cyanea* 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: 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 *Calectasia cyanea*, 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 the population of the species. Where no role is identified for the indigenous community associated with this species in the development of the recovery plan, 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 recovery plan is unlikely to cause significant adverse social and economic impacts as the population is located in National Park.

Affected interests: No stakeholders have been identified that will be affected by the implementation of this plan.

Evaluation of the plan's performance: The Department of Environment and Conservation (DEC), in conjunction with the Albany District Threatened Flora Recovery Team 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 five years of implementation.

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

1. Between 2002 and 2006, DEC staff conducted surveys for *Calectasia cyanea* along the coast, west, south and east of Albany. No additional populations were found.
2. Between 2002 and 2005, staff of DEC's Threatened Flora Seed Centre (TFSC) made collections of seed from *Calectasia cyanea*.
3. Declared Rare Flora markers have been installed at the population.
4. The ADTFRT is overseeing the implementation of this IRP and will include it in its annual report to DEC's Corporate Executive and funding bodies.
5. Staff from DEC's Albany District have been monitoring the population of *Calectasia cyanea* since 2002.
6. A poster has been produced for *Calectasia cyanea*.
7. The habitat of the species is excluded from prescribed burning.

IRP objective: The objective of this IRP is to abate identified threats and maintain or enhance a 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 have increased by twenty five percent or more over the term of the plan.

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

Recovery actions

1. Coordinate recovery actions
2. Monitor population
3. Collect seed and other material to preserve genetic diversity
4. Develop and implement a fire management strategy
5. Obtain biological and ecological information
6. Conduct further surveys
7. Promote awareness
8. Map habitat critical to the survival of *Calectasia cyanea*
9. Prepare a translocation proposal
10. Review the Plan and need for further recovery actions

1. BACKGROUND

History

Described by Robert Brown (1810), *Calectasia cyanea* was once considered a widespread, common species but, following a taxonomic revision by Barrett and Dixon (2001) which split the species into a number of separate taxa, is now recognised as occurring only south of Albany where it is known from a single population totalling 70 mature and 30 juvenile plants.

Description

Calectasia cyanea is an undershrub to 40 cm, with a few short lateral branches, usually with stilt roots. Leaves are 6.5 to 13 mm long by 1.0 to 1.3 mm wide, lack hairs, and have rough margins, the apex tapering to a sharp point. Bracts are 6.8 to 7.5 mm long by 1.6 to 2.3 mm wide, light green to pale brown in colour. Perianth tube is 6.5 by 8.0 mm long, with distinct hairs in the lower half to two thirds. The throat has a tangle of short hairs and the lobes are papery, 8.3 to 11.2 mm long by 2.1 to 3.3 mm wide, dark blue, fading to white with hairs on the underside. The anthers are 4.9 to 5.2 mm long, yellow, turning orange-red with age. The style is generally 9.5 mm long or occasionally to 12 mm long and exceeds the anthers.

Calectasia cyanea is most closely related to *C. gracilis* and *C. pignattiana* but differs in its clumping habit (due to vigorous basal sprouting). It also differs from *C. pignattiana* in its mature leaves that are not turned downwards (Barrett and Dixon, 2001).

Distribution and habitat

Calectasia cyanea has a restricted distribution of approximately 0.02 km² south of Albany. Habitat is yellow sand or gravel over laterite in low near coastal heathland. Associated species include *Adenanthos cuneatus*, *Agonis flexuosa*, *Banksia grandis*, *Melaleuca thymoides*, *Hakea ruscifolia*, *H. prostrata*, *Allocasuarina humilis*, *Spyridium globulosum*, *Jacksonia horrida* and *Lysinema ciliatum*.

Summary of population land vesting, purpose and management

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1. S of Albany*	Albany	Albany	Conservation Commission of Western Australia	National Park and Recreation	DEC

*This population is considered an important population.

Biology and ecology

Calectasia cyanea is an obligate seeder with mature plants killed by fire and populations recruiting post-fire from soil seed banks (Barrett and Dixon, 2001). Barrett and Dixon (2001) conclude it takes between two and five or more years for stilt-rooted species such as *C. cyanea* to reach reproductive maturity and presumably a substantially longer period to attain maximum reproductive potential. Grazing may contribute to slow growth rates and long juvenile period. Monitoring of plants that recruited after fire in 1997 showed that it took seven years for 50% of plants monitored to reach reproductive maturity (S. Barrett pers. comm.).

Flowers of *Calectasia* species are buzz pollinated and may also self pollinate (Barrett and Dixon, 2001).

The seeds of species in the genus *Calectasia* are retained within the perianth which, once mature, breaks off and is distributed by wind. The perianth tube has a pungent apex with stiff hairs facing upwards allowing it to penetrate the soil (Barrett and Dixon, 2001).

Barrett and Dixon (2001) conclude that *Calectasia* species are commonly parasitized by *Cassytha* species (Lauraceae).

Threats

Calectasia cyanea was declared as Rare Flora in 2003 under the Western Australian *Wildlife Conservation Act 1950* and was ranked at that time as Critically Endangered (CR) under the World Conservation Union (IUCN 2001) Red List criteria C2a(i); D based on the species area of occupancy being less than 10 km² with all plants known from a single population containing fewer than 50 mature plants. Additional mature plants have since been found and the species no longer meets CR based on the above criteria. However, it is proposed that the ranking of *Calectasia cyanea* remain CR due to there being a single population that may be damaged or destroyed by a single event. The species is listed as CR under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats are inappropriate fire regimes, small population size and grazing.

- **Inappropriate fire regimes.** *Calectasia cyanea* is an obligate seeder taking up to seven years for plants to reach reproductive maturity and replenish the soil seed bank. Grazing may contribute to this long juvenile period. The occurrence of frequent fires before juveniles mature may therefore result in population decline or extinction. The only known population narrowly escaped wildfire in 2003 when a firebreak was installed to protect the population.
- **Small population size** As *Calectasia cyanea* is known from a single population, the likelihood of the species falling victim to chance demographic or environmental events is high. Furthermore, 30% of juvenile plants monitored from 2002 to 2007 died, the reasons for plant death are unclear.
- **Grazing** by western grey kangaroos or other herbivores has been noted since monitoring of tagged *Calectasia cyanea* plants commenced in 2002. Some plants were caged in 2003 to exclude grazing however not all caged plants have grown vigorously since then.

The intent of this plan is to propose actions that will deal with immediate threats to *Calectasia cyanea*. Although long-term threats such as climate change may impact on the species, action taken to protect species from climate change is beyond the scope of this plan.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Current Condition	Threats
1. S of Albany*	National Park	2002 20 (16)	Moderate	Inappropriate fire regime, grazing
		2003 60 (22) [4+]	Moderate	
		2004 50 (20) [3+]	Moderate	
		2005 70 (30) [3+]	Moderate	
		2006 100+/- (50+/-) [1+]		

* This population is considered to be an important population. Note: () = number of seedlings, [] = number dead

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments and/or land clearing in the immediate vicinity of the population of *Calectasia cyanea* 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 *Calectasia cyanea* 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 *C. cyanea* includes the area of occupancy of the population, areas of similar habitat surrounding the population (this is necessary to provide habitat for pollinators and future population expansion) and additional occurrences of similar habitat that may contain unrecorded populations of the species or be suitable for future translocations.

Benefits to other species or ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Calectasia cyanea* will improve the status of associated native vegetation. Four priority flora species are located with *Calectasia cyanea* and are listed in the table below.

Conservation-listed flora species occurring in habitat of *Calectasia cyanea*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act, 1999)
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<i>Adenanthos cunninghamii</i>	Priority 4	-

For a description of the Priority categories see Atkins (2006)

International obligations

This plan is 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. *Calectasia cyanea* is not listed under any specific international treaty and this IRP does not affect Australia's obligations under any other international agreements.

Role and interests of indigenous people

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 *Calectasia cyanea*, 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 the population of the species. Where no role is identified for the indigenous community associated with this species in the development of the recovery plan, 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 recovery plan is unlikely to cause significant adverse social and economic impacts as the population is located in National Park.

Affected interests

No stakeholders have been identified that will be affected by the implementation of this plan.

Evaluation of the plan's performance

The Department of Environment and Conservation (DEC), in conjunction with the Albany District Threatened Flora Recovery Team 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 five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

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

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

3. RECOVERY ACTIONS

Existing recovery actions

Between 2002 and 2006, DEC staff conducted surveys for *Calectasia cyanea* west, south and east of Albany. No additional populations were found.

Between 2002 and 2005, staff of DEC's Threatened Flora Seed Centre (TFSC) made collections of seed from *Calectasia cyanea*.

Declared Rare Flora markers have been installed at the population.

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

Staff from DEC's Albany District have been monitoring the population of *Calectasia cyanea* since 2002.

A poster has been produced for *Calectasia cyanea*.

The habitat of the species is excluded from prescribed burning.

Future recovery actions

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 Albany District Threatened Flora Recovery team (ADTFRT) will coordinate recovery actions for *Calectasia cyanea* and other Declared Rare Flora in their District. They will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

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

2. Monitor population

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

Action: Monitor population
Responsibility: DEC (Albany Work Centre) through the ADTFRT
Cost: \$600 annually.

3. Collect seed and other material to preserve genetic diversity

DEC's Threatened Flora seed Centre (TFSC) currently holds 149 fruits from *Calectasia cyanea*. Preservation of genetic material is essential to guard against extinction of the species if the wild population is lost and it is recommended that additional seed be collected and stored. Consideration should also be given to holding

material in other forms, including living collections and tissue collections at Botanical Gardens and Parks Authority (BGPA). Collections should aim to sample and preserve the maximum range of genetic diversity possible. The *Germplasm Conservation Guidelines for Australia* produced by the Australian Network for Plant Conservation (ANPC) should be used to guide this process (ANPC, 1997).

Action: Collect seed and other material to preserve genetic diversity
Responsibility: DEC (Albany Work Centre, TFSC) and BGPA through the ADTFRT
Cost: \$3,200 in years 1, 3 and 5.

4. Develop and implement a fire management strategy

Calectasia cyanea is an obligate seeder. Mature plants are killed by fire and the species regenerates from soil stored seed, taking up to seven years to reach maturity. If plants are burnt before they reach maximum reproductive potential the population is likely to decline. Prescribed fire will be excluded from the known population for the life of this plan. The development and implementation of a fire management strategy is recommended and will be addressed under this action.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Albany Work Centre) through the ADTFRT, and relevant authorities
Cost: \$2,900 in year 1, and \$1,700 in years 2 to 5.

5. Obtain biological and ecological information

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

1. Investigate the species' pollination biology and identify pollinators.
2. Investigate seed viability, soil seed bank size and longevity.
3. Investigate conditions necessary for germination.
4. Investigate the species' response to disturbance such as fire.
5. Investigate longevity of plants, time taken to reach maturity, impacts of grazing and time taken to replenish soil seed banks.

Actions: Obtain biological and ecological information
Responsibility: DEC (Science Division, TFSC, Albany Work Centre) through the ADTFRT
Cost: \$13,000 per year in years 1 to 3, \$18,000 in year 4.

6. Conduct further surveys

To evaluate population health, size and threats, *Calectasia cyanea* will be regularly surveyed during the species flowering period between July and January. This will be done with assistance from local naturalists, community volunteers, wildflower societies and naturalists clubs.

It is suggested that surveys of the population be done in conjunction with surveying other possible areas of suitable habitat.

Action: Conduct further surveys
Responsibility: DEC (Albany Work Centre) through the ADTFRT
Cost: \$3,500 in years 1, 3 and 5.

7. Promote awareness

The importance of biodiversity conservation and the protection of *Calectasia cyanea* 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 has been developed for *C. cyanea* and will be further distributed to local land owners, relevant authorities and volunteer organizations, 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 continue to be encouraged. A poster has been produced for the annual Albany Wildflower Society and Agricultural shows and may be used at other venues.

To minimize the risk destruction, it is recommended that the exact location of *Calectasia cyanea* be kept from the general public. Such information should, however, be given to relevant authorities.

Action: Promote awareness
Responsibility: DEC (Albany Work Centre, Species and Communities Branch (SCB) and Strategic Development and Corporate Affairs Division) through the ADTFRT
Cost: \$1,600 in the first year; \$1,000 per year in years 2 to 5.

8. Map habitat critical to the survival of *Calectasia cyanea*

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 additional populations are located, critical habitat will also be determined and mapped for them.

Action: Map habitat critical to the survival of *Calectasia cyanea*
Responsibility: DEC (Albany Work Centre, SCB) through the ADTFRT
Cost: \$3,100 in year 1.

9. Prepare a translocation proposal

Although *Calectasia cyanea* occurs within a National Park, its restricted distribution makes the species vulnerable to chance disturbance events and it is recommended that a translocation proposal is 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 and implement a translocation proposal
Responsibility: DEC (Albany Work Centre) through the ADTFRT
Cost: \$2,800 in year 5.

10. Review the Plan and 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 plan and need for further recovery actions
Responsibility: DEC (SCB, Albany Work Centre) through ADTFRT
Cost: \$1,500 in year 5

Summary of recovery actions

Recovery Actions	Priority	Responsibility	Completion date
Coordinate recovery actions	High	ADTFRT	Ongoing
Monitor population	High	DEC (Albany Work Centre) through the ADTFRT	Ongoing
Collect seed and other material to preserve genetic diversity	High	DEC (Albany Work Centre) and BGPA through the ADTFRT	Ongoing
Develop and implement a fire management strategy	High	DEC (Albany Work Centre) through the ADTFRT, and relevant authorities	Developed by 2008 with implementation ongoing
Obtain biological and ecological information	High	DEC (Science Division, TFSC, Albany Work Centre), BGPA through the ADTFRT	2011
Conduct further surveys	High	DEC (Albany Work Centre) through the ADTFRT	Ongoing
Promote awareness	High	DEC (Albany Work Centre, SCB and Strategic Development and Corporate Affairs Division) through the ADTFRT	Ongoing

Map habitat critical to the survival of <i>Calectasia cyanea</i>	Moderate	DEC (Albany Work Centre, SCB) through the ADTFRT	2008
Prepare a translocation proposal	Moderate	DEC (Albany Work Centre) through the ADTFRT	2012
Review the Plan and need for further recovery actions	Moderate	DEC (SCB, Albany Work Centre) through the ADTFRT	2012

4. TERM OF PLAN

This IRP will operate from July 2007 to June 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

- Atkins, K. (2006). *Declared Rare and Priority Flora List for Western Australia*. Department of Conservation and Land Management, Perth, Western Australia
- Australian Network for Plant Conservation. (1997). *Germplasm Conservation Guidelines for Australia, An introduction to the principles and practices for seed and germplasm banking of Australian Species*. Canberra, Australian Network for Plant Conservation Germplasm Working Group.
- Barrett, R.L. and Dixon, K.W. (2001). A revision of the genus *Calectasia* (Calectasiaceae) with eight new species described from south-west Western Australia. *Nuytsia*. **13** (3): 411-448.
- Brown, R. (1810). *Prodromus Florae Novae Hollandiae*. 263-264.
- CALM (1992). Policy Statement No. 44 *Wildlife Management Programs* Department of Conservation and Land Management, Perth, Western Australia.
- CALM (1994). Policy Statement No. 50 *Setting Priorities for the Conservation of Western Australia's Threatened Flora and Fauna*. Department of Conservation and Land Management, Perth, Western Australia.
- CALM (1995). Policy Statement No. 29 *Translocation of Threatened Flora and Fauna* Department of Conservation and Land Management, Perth, Western Australia.
- 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/>.
- IUCN (2001). *IUCN Red List Categories: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

6. TAXONOMIC DESCRIPTION

Excerpt from: Barrett, R.L. and Dixon, K.W. (2001). A revision of the genus *Calectasia* (Calectasiaceae) with eight new species described from south-west Western Australia. *Nuytsia*. **13** (3): 411-448.

Undershrub, usually with stilt roots; rhizome absent. *Stems* to 40 cm, with few short lateral branches, crowded at the apex. *Leaves*: lamina 6.5-13.2 x 1.0-1.3 mm, glabrous, margins scabrous, apex acute with a pungent mucro 0.5-0.7 mm long; sheath with sparse branched trichomes with branched trichomes on margin. *Bracts* 6.8-7.5 x 1.6-2.3 mm, light green and pale brown, lamina apex and margins with branched trichomes, apex with vestigial leaf lamina 2.5-3.1 x 0.5 mm. *Perianth*: tube 6.5-8.0 mm long, pilose in lower half-two thirds; throat with tangle of short hairs; lobes chartaceous, 8.3-11.2 x 2.1-3.3 mm, apex acute, dark blue, fading to white, pilose on abaxial side. *Staminal filaments* 2.6-3.0 mm long. *Anthers* 4.9-5.2 x 0.9-1.2 mm, yellow, turning orange-red with age, pores terminal. *Style* 9.5-(12) mm long, exceeding anthers. *Seeds* not seen.

Calectasia cyanea is most closely related to *C. gracilis* and *C. pignattiana* but differs in its clumping habit (due to vigorous basal sprouting). It also differs from *C. pignattiana* in its non-reflexed mature leaves.

