INTERIM RECOVERY PLAN NO. 69

BLUE BABE-IN-THE-CRADLE ORCHID

(EPIBLEMA GRANDIFLORUM VAR. *CYANEUM* MS*)*

INTERIM RECOVERY PLAN

2000-2003

by

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Photo: Andrew Brown

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Natural Heritage Trust
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Department of Conservation and Land Management

THE GOVERNMENT OF WESTERN AUSTRALIA

FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (CALM) Policy Statements Nos. 44 and 50.

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

CALM is committed to ensuring that Critically Endangered taxa are conserved through the preparation and implementation of Recovery Plans or Interim Recovery Plans and by ensuring that conservation action commences as soon as possible and always within one year of endorsement of that rank by the Minister.

This Interim Recovery Plan will operate from July 2000 to June 2003 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

This IRP was approved by the Director of Nature Conservation on 20 August 2000. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at July 2000.

SUMMARY

Scientific Name: *Epiblema grandiflorum* var. *cyaneum* ms
Family: Orchidaceae
CALM Region: Swan
Shire: Swan
Recovery Team: Swan Region Threatened Flora and Communities Recovery Team (SRTFCRT)
Common Name: Blue Babe-in-the-Cradle Orchid
Flowering Period: Late November to January
CALM District: Perth

Illustrations and/or further information: Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998). *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia. Hoffman, N. and Brown, A. (1998) *Orchids of South West Australia.* Revised 2nd Edition with supplement. University of Western Australia Press, Nedlands.

Current status: *Epiblema grandiflorum* var. *cyaneum* ms was declared as Rare Flora in May 1991, and was ranked as Critically Endangered (CR) in February 1997. It currently meets World Conservation Union (IUCN) Red List category 'CR' under criteria A1a, C2b and D as it is only known from a single population comprised of less than 50 mature individuals, with continued decline in the quality of the habitat. The main threats are changes to the hydrology of the habitat, fire, weeds, insect predation and disturbance by users of the Nature Reserve in which the taxon occurs.

Habitat requirements: *Epiblema grandiflorum* var. *cyaneum* ms is only known from a single population that occurs in a small Nature Reserve near Perth. It occurs on grey peaty sands in amongst dense sedges under *Melaleuca preissii* in a winter-wet swamp. The plants flower as the water level begins to fall in the wetland area in late spring.

Critical habitat: The critical habitat for *Epiblema grandiflorum* var. *cyaneum* ms comprises the area of occupancy of the known population; areas that have shallow surface water during spring, followed by drying out during summer, with dense sedges and *Astartea fascicularis* under *Melaleuca preissiana* and *M. rhaphiophylla* within 200 metres of the known population; the local catchment for the surface and ground waters that provide the wetland habitat of the orchid; corridors of remnant vegetation that link populations, if other populations of the orchid are located; additional areas that have shallow surface water during spring, followed by drying out during summer with dense sedges and *Astartea fascicularis* under *Melaleuca preissiana* and *M. rhaphiophylla* and that do not currently contain the subspecies.

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

1. All appropriate people have been made aware of the existence of this taxon and its locations.
2. A drainage system with a gate has been installed to regulate water flows into and out of the wetland habitat.
3. The groundwater level near the habitat is monitored regularly.
4. Protective barriers have been erected and are maintained as necessary.
5. The area in which the orchid occurs was declared a Nature Reserve in 1998.
6. Trees have been planted on the northern, western and southern side of the orchid habitat.
7. Staff of Botanic Gardens and Parks Authority (BGPA) and University of WA are currently researching the orchids' biology and ecology.
8. Seed collected in 1999 is stored at the BGPA.
9. Staff from CALM's Swan Region regularly monitor the population.
10. The SRTFCRT is overseeing the implementation of this IRP and will include information on progress in its annual report to CALM's Corporate Executive and funding bodies.

IRP Objective: The objective of this Interim Recovery Plan (IRP) is to abate identified threats and maintain and/or enhance *in situ* populations to ensure the long-term preservation of the taxon in the wild.

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

Future recovery actions
1. Coordinate recovery actions
2. Monitor water levels and quality
3. Implement fire management strategy
4. Maintain restrictions to access
5. Collect seed and tissue culture material
6. Undertake weed control
7. Monitor population
8. Conduct further surveys
9. Obtain biological and ecological information
10. Promote awareness
11. Propagate plants for translocation
12. Undertake and monitor translocation
13. Write full Recovery Plan

1. BACKGROUND

History

The first known collection of *Epiblema grandiflorum* var. *cynaeum* ms, was made in 1987 by Dr Kingsley Dixon. This single known population occurs with *Epiblema grandiflorum* var. *grandiflorum* on a Nature Reserve near Perth. *E. grandiflorum* var. *cynaeum* ms was previously recorded from two populations but it is now thought that a population reported to occur near Walpole is not a true representative of this variety.

In 1987 and 1988 about 200 non-flowering and six flowering plants were recorded in the known population. The non-flowering specimens were identified only from leaves and a proportion of these may have been *Epiblema grandiflorum* var. *grandiflorum*. The area had been burnt each of these years, and the recorder noted that the site was permanently wet. There have since been alterations to hydrology in the area associated with roadworks, development of land surrounding the population, and with drainage works for the general area. Negotiations with the then owner of the land on which the population occurs resulted in the area being declared a Nature Reserve in 1998 and the site is now under the care, control and management of CALM. The previous landowner fenced the entire swamp to protect the population from accidental damage. The surrounding area has been progressively developed for housing.

Twenty nine plants were recorded in 1990 to 1992. In 1995-1996, a flood that may have been associated with alterations to the hydrological regime near the known population was recorded in the wetland at the site. Despite extensive searches of the swamp in 1996, 1997 and 1998 no flowering plants were recorded. However, in 1999, the Orchid Society and Study Group and a scientist from The University of Western Australia (UWA) located 1 plant of the taxon in flower. Seed was collected from this plant later that year by the UWA scientist.

Description

Within the genus *Epiblema*, there is only one species, containing two varieties, and these are both endemic to the south west of Western Australia. The more common babe-in-a-cradle orchid (*Epiblema grandiflorum* var. *grandiflorum*) occurs in peaty swamps along the coastal plain between Gingin and Esperance. The only difference between the two varieties is that *E. grandiflorum* var. *cynaeum* ms has pale blue flowers instead of purple to mauve flowers.

The common name for *Epiblema grandiflorum* originates from a story told to Rika Erikson by a child with whom she was bushwalking. The child told her "we always call it Babe-in-a-Cradle Orchid because you see him kicking off the rug".

Epiblema grandiflorum var. *cyaneum* ms flowers in late November to January. Plants are between 25 and 80 cm in height. It has a slender, erect stem with a basal, narrowly rounded leaf 20-25 cm long and two shorter, erect stem bracts. There are usually up to six stalked flowers in a loose inflorescence. Each flower is 2-4 cm in diameter. The spreading sepals and lateral petals are almost equal in size. The labellum (lip) is egg-shaped with a distinct claw and a tuft of linear calli (glands) at the base. The column is short with thin, erect lobes. The main distinguishing features of the flower are the cluster of ribbon-like appendages at the base of the labellum and the broadly-winged column.

There are no known collections of *E. grandiflorum* var. *cyaneum* ms at the WA Herbarium and a full taxonomic description has not been written for this taxon.

Distribution and habitat

The specific habitat requirements of *Epiblema grandiflorum* var. *cyaneum* ms are not well studied, but are believed to be similar to those of the more common variety *Epiblema grandiflorum* var. *grandiflorum*. The latter variant requires a very specific hydrological regime to survive and flower, and is only found in wetlands with that particular regime.

Epiblema grandiflorum var. *cyaneum* ms is endemic to Western Australia. It is apparently confined to a single swamp in the Perth Metropolitan area and is known from only one population. The plants grow amongst dense sedges and *Astartea fascicularis* under *Melaleuca preissiana* and *M. rhaphiophylla* bordering a winter-wet swamp. They usually grow in shallow water and flower as the water level begins to drop.

Epiblema grandiflorum var. *cyaneum* ms appears to require a water depth of 10-20 cm during spring to initiate flowering, followed by drying out during summer. The water level is determined by groundwater, surface water inflow from another nearby wetland and a main drain and from surface outflows to the same main drain. Since 1963 all surface flows have been artificial as a result of drainage works in the general area. A road culvert near the site probably limits maximum water levels, but not the minimum levels of the wetland.

Urban development in the immediate area of the wetland in which *Epiblema grandiflorum* var. *cyaneum* ms occurs was predicted to cause an increase in the height of the local watertable peaking five years after the development that occurred in 1995-1996. It is believed that this will be followed by a fall in groundwater levels, possibly even to below the original height, as a consequence of abstraction of water from private bores.

The soils at the known population are grey sands overlying pebbly silts. Groundwater moves beneath the site and fluctuates about 1 m in depth between summer and winter. The winter rise in groundwater results in the inundation of the site in winter.

Critical Habitat

Critical habitat is habitat identified as being critical to the survival of a listed threatened species or listed threatened ecological community. Habitat is defined as the biophysical medium or media (a) occupied (continuously, periodically or occasionally) by an organism or group of organisms; or (b) once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind that the potential to be reintroduced. (sections 207A and 528 of Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)).

The critical habitat for *Epiblema grandiflorum* var. *cyaneum* ms comprises:

- the area of occupancy of the known population,
- areas that have shallow surface water during spring, followed by drying out during summer, with dense sedges and *Astartea fascicularis* under *Melaleuca preissiana* and *M. rhaphiophylla* within 200 metres of the known population (these provide potential habitat for natural range extension),
- the local catchment for the surface and ground waters that provide the wetland habitat of the orchid (the orchid occurs in seasonal wetland areas and is dependent on maintenance of local hydrology),
- corridors of remnant vegetation that link populations, if other populations of the orchid are located (these are necessary to allow pollinators to move between populations and are usually road and rail verges),
- additional areas that have shallow surface water during spring, followed by drying out during summer with dense sedges and *Astartea fascicularis* under *Melaleuca preissiana* and *M. rhaphiophylla* and that do not currently contain the subspecies (these represent possible translocation sites).

Biology and ecology

It is thought (K. Dixon[1] personal communication) that this taxon can grow in areas that have been recently burnt, but it can also flower in the absence of fire. In 1999, a plant flowered following 10 years in which the habitat had not been burnt.

It is not know what pollinates this taxon, whether viable seed is produced, how the seed is dispersed or the requirements for germination. It is known, however, that *Epiblema grandiflorum* var. *cyaneum* ms requires a particular mycorrhizal fungus for germination and growth. The plants and the fungus are likely to be very vulnerable to physical disturbance, altered fire regimes, and declining water quality or altered hydrology. A researcher from Botanic Garden and Parks Authority in conjunction with The University of Western Australia is undertaking a study of some aspect of this orchid's biology, including genetics and propagation techniques.

Threats

Epiblema grandiflorum var. *cyaneum* ms was declared as Rare Flora in May 1991, and was ranked as Critically Endangered (CR) in February 1997. It currently meets 'CR' under IUCN Red List criteria A1a, C2b and D (IUCN 1994) due to the restricted distribution, and declining population size and quality of the habitat.

The scarcity of this orchid is probably due to the inherent rarity of this variant coupled with the very specific habitat requirements, and the level of clearing and drainage of wetlands that has occurred for urban development and agricultural purposes. There has been a continuing decline in the size of the known population for around 10 years.

The main threats to *Epiblema grandiflorum* var. *cyaneum* ms are altered water quality and quantity, inappropriate fire regimes, weed invasion, increased visitor usage of the reserve in which the orchid occurs, insect predation of the capsule, and possibly the impacts of dieback disease caused by the plant pathogen *Phytophthora* spp. on the habitat.

- **An altered hydrological regime** is likely to result from the development of a housing estate, drains, and roads around the orchid habitat. Flooding of the area that occurred in 1995/1996 may be linked to altered hydrology.

- **Pollution of the groundwater** from local sources such as herbicide and fertiliser applications from nearby housing lots, and other chemicals from runoff from roads may affect the taxons' growth and survival. The diversion of a major drain that flowed into the area and design of the drainage system within the adjoining urban area have largely addressed the threat of water quality deterioration.

[1] Dr Kingsley Dixon - Assistant Director (Plant Science) Botanic Garden and Parks Authority

However threats still exist from the use of herbicides and fertilisers in the immediate vicinity of the reserve, particularly in the adjoining public open space which includes lawn areas.

- **Inappropriate fire regimes** would adversely affect the viability of populations, as seeds of *Epiblema grandiflorum* var. *cyaneum* ms probably germinate following fire. It is likely that occasional fires are needed for reproduction of this taxon. The timing and frequency of fire is crucial in the management of orchid species. It is important to exclude fire during the vegetative and flowering phases (June to December) as fire at this time prevents seed formation, and kills the plants. Autumn burns are likely to be the most appropriate to sustain or increase populations of this orchid, although fire in the very dense habitat is likely to be more difficult to control at that time of year.

  The proximity of urban development is likely to result in increased fire frequency in the area.

- **Weed invasion** and invasion by other local species is a threat to this orchid. Local dryland or aquatic species may invade the site if hydrology of the site is sufficiently altered. Weeds such as *Typha orientalis* (Asian Bulrush) may encroach on the site, even in the absence of altered hydrology. Other weeds, such as grassy species may also encroach on the site in response to increased disturbance associated with urban development and road maintenance on adjacent lands. Weeds suppress early plant growth by competing for soil moisture, nutrients and light.

- **Trampling and general disturbance of the habitat** including deliberate vandalism are a serious threat to this orchid, as it occurs immediately adjacent to urban development. A high fence has been erected around the area to help overcome this problem.

- **Insect predation** on the capsule may be a threat to the survival of this taxon. Given that only one flowering specimen has been located in recent years, insects may totally destroy reproductive potential.

- **Dieback disease** caused by the plant pathogen *Phytophthora cinnamomi* does not generally impact orchid species, although susceptibility of *Epiblema grandiflorum* var. *cyaneum* ms to the disease is not known. However, the disease can indirectly impact orchids by altering habitat. For example, the disease can result in a reduction in canopy cover which may disadvantage a taxon that requires high levels of cover.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1 Malaga	Nature Reserve	1987 (200) 1988 6(200) 1992 29 1996 0 1997 0 1998 0 1999 1	Healthy	Altered hydrology, pollution, change in fire regime, weeds, trampling

Number in brackets = number of non-flowering plants (may include some individuals of *Epiblema grandiflorum* var. *grandiflorum*)

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of the population or within the defined critical habitat of *Epiblema grandiflorum* var. *grandiflorum* require assessment. No developments should be approved unless the proponents can demonstrate that they will have no significant impact on the orchid, its habitat or potential habitat, or on the local hydrology.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

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

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

3. RECOVERY ACTIONS

Existing recovery actions

All appropriate people have been made aware of the existence of this taxon and its locations.

Alterations to the surrounding hydrological pattern have occurred due to development of the surrounding habitat for housing. A drainage system with a gate has been installed to regulate the flow of water into and out of the swamp where this taxon occurs.

The groundwater level near the wetland in which Population 1 occurs is monitored regularly by the Water and Rivers Commission.

A cyclone fence was installed around the swamp habitat of this taxon in late 1996 to maintain the security of the population and prevent accidental damage. A pine bollard fence was erected at the same time around the perimeter of the public open space that surrounds the orchid habitat on three sides. This fence is expected to prevent vehicles entering the area. The condition of these barriers is monitored regularly and maintained as necessary by staff of CALM's Perth District.

The area in which the orchid occurs was declared a Nature Reserve in 1998.

Trees have been planted on the northern, western and southern side of the orchid habitat. It was anticipated that clearing for a recent housing development would result in a rise in the water table and trees were planted in 1996 to help mitigate this potential problem.

Staff of BGPA and UWA are currently researching the taxons' biology and ecology, including germination and propagation methods.

Two capsules of seed were collected from the plant that flowered in 1999. This is in cryostorage at the BGPA.

Staff from CALM's Perth District regularly monitor the population.

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

Future recovery actions

Where recovery actions are implemented on lands other than those managed by CALM, permission has been or will be sought from the appropriate land managers prior to actions being undertaken.

A Wetland Management Strategy (Bowman, Bishaw, Gorham 1995) and draft Interim Management Guidelines prepared by CALM staff (CALM 2000a) are in place to help protect the orchid's habitat from impacts of adjacent development. This IRP will be implemented in conjunction with these documents.

1. Coordinate recovery actions

The SRTFCRT will continue to oversee the implementation of the recovery actions for *Epiblema grandiflorum* var. *cyaneum* ms and will include information on progress in its annual report to CALM's Corporate Executive and funding bodies.

Action:	Coordinate recovery actions
Responsibility:	CALM (Perth District) through the SRTFCRT
Cost:	$4,500 per year

2. Monitor water levels and quality

Water and Rivers Commission monitor the groundwater levels in a bore located close to the reserve in which Population 1 occurs. Data indicate that water levels have fluctuated seasonally from a minimum of around 28.6 m AHD to a maximum of around 29.6 m AHD. CALM has developed Draft Operational Guidelines for maintaining groundwater levels within this reserve (CALM 2000b). These guidelines provide a basis for monitoring and artificially regulating wetland water levels to approximate the hydrological regime prior to the development of the surrounding land. The monitoring results will continue to be examined and the implications for management determined. Future water quality monitoring will ideally include measurements of pesticides, and nutrient contamination in samples taken in spring.

Action:	Monitor water levels and quality
Responsibility:	CALM (Perth District) through the SRTFCRT
Cost:	$1000 per year

3. Implement fire management strategy

Little is known about the effects of fire on this taxon, however, numbers of flowering specimens appears to increase following fire. It is likely that the taxon requires occasional fire for recruitment from soil stored seed, but fires during the vegetative and flowering phase from June to December may be detrimental to the long-term survival of the taxon. Fire also promotes the introduction of weed species.

A fire management strategy has been developed by CALM's Perth District in consultation with relevant authorities as part of Draft Interim Management Guidelines developed by CALM for the Nature Reserve in which the orchid occurs. If possible, management will include a mosaic of small recovery burns in April, or the first week of May at the latest, on a 10-15 year rotation within the reserve to stimulate flowering.

Action: Implement fire management strategy
Responsibility: CALM (Perth District), through the SRTFCRT
Cost: $1,000 per year

4. Maintain restrictions to access

Access to the area by foot is restricted. A complete ban on vehicular access at any time has been imposed. For this ban to be effective the gate will be locked at all times and the keys provided only to authorised personnel. In addition the fence condition will be monitored on a regular basis, and maintained.

Action: Maintain restrictions to access
Responsibility: CALM (Perth District) through the SRTFCRT
Cost: $500 per year

5. Collect seed and tissue culture material

Germplasm collections are essential due to the low number of plants and the possibility of destruction of the habitat. Some seed of *Epiblema grandiflorum* var. *cyaneum* ms has now been collected. Hand pollination of the orchid may be required to promote a higher seed set. If it is not possible to collect adequate quantities of viable seed, other more costly methods of germplasm storage may need to be investigated. These may involve living collections or storage of tissue culture material.

Action: Collect seed and tissue culture material
Responsibility: CALM (Perth District, CALMScience), BGPA through the SRTFCRT
Cost: $3,600 per year

6. Undertake weed control

The population is not weed infested at present. However, weed control in the buffer area near the cyclone fence is required, as it is possible that weeds may invade into the orchid habitat from that area. Weed monitoring (see also action 7) will include regular searching for typha (*Typha orientalis*) invading the wetland area, as this probably represents the greatest weed threat to the orchid. Control measures such as wick application of herbicides and hand slashing and pulling will be undertaken as required. A weed control program will involve:

1. Accurately mapping the boundaries of the populations.
2. Selection of an appropriate herbicide or method of weed control after determining which weeds are present.
3. Controlling invasive weeds internal to the boundary by hand removal or spot spraying around individual *E. grandiflorum* var. *cyaneum* ms plants when weeds first emerge.

4. Scheduling to include weed spraying of other DRF populations requiring weed control within the district.

Action: Undertake weed control
Responsibility: CALM (Perth District, CALMScience) through the SRTFCRT
Cost: $500 per year

7. Monitor population

Monitoring of factors such as weed encroachment, habitat degradation, population stability (expansion or decline), pollination activity, seed production, recruitment and longevity is essential. Insect predation of capsules will also be monitored. Hand pollination and enclosing flowers in hessian bags prior to capsule formation may be necessary if insects are impacting on reproductive potential. The population will be inspected annually.

Action: Monitor population
Responsibility: CALM (Perth District) through the SRTFCRT
Cost: $800 per year

8. Implement dieback hygiene

Disease hygiene measures will be maintained to help prevent introduction of dieback disease or amplification of the impact of the disease. The locked gate will continue to prevent public vehicular and foot access. People entering the reserve for management purposes will also ensure any machinery used and footwear is clean. A sign advising of the dieback risk will be posted at this site.

Action: Implement dieback hygiene
Responsibility: CALM (Perth District) through the SRTFCRT
Cost: $800 per year

9. Conduct further surveys

Further survey for the taxon will be undertaken in areas of suitable habitat during the orchid's flowering period. Volunteers from the local community, wildflower societies and naturalist clubs will be encouraged to be involved in surveys supervised by CALM staff.

Action: Conduct further surveys
Responsibility: CALM (Perth District) through the SRTFCRT
Cost: $1,700 per year

10. Obtain biological and ecological information

Increased knowledge of the biology and ecology of the taxon will provide a scientific base for management of *Epiblema grandiflorum* var. *cyaneum* ms in the wild. Research will ideally include:

1. Knowledge of the extent of genetic variation within the known population and between Population 1 and the colour variant of *Epiblema grandiflorum* that occurs at Walpole.
2. Development of propagation techniques
3. Study of the role of various factors including disturbance, competition, rainfall and grazing in recruitment and seedling survival.
4. Determination of reproductive strategies, phenology and seasonal growth.
5. Investigation of the mating system and pollination biology.
6. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.

Investigations listed under points 1. and 2. are currently being undertaken by BGPA in conjunction with UWA.

Action: Investigate biology and ecology
Responsibility: CALM (CALMScience, Perth District) and BGPA, through the SRTFCRT
Cost: $15,600 per year

11. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Epiblema grandiflorum* var. *cyaneum* ms will be promoted to the public. An information sheet that includes a description of the plant, its habitat type, threats and management actions, and photos will be produced. Formal links with local groups and interested individuals will continue to be encouraged, as the Native Orchid Society and Study Group are currently involved in management of this orchid.

Action: Promote awareness
Responsibility: CALM (WATSCU, Perth District, Corporate Relations) through the SRTFCRT
Cost: $600 per year

12. Propagate plants for translocation

The propagation of plants in readiness for translocation is essential as the only known populations are under threat in the wild.

Action: Propagate plants for translocation
Responsibility: CALM (Perth District) and BGPA, through the SRTFCRT
Cost: $6,000 in the first and second years

13. Undertake and monitor translocation

Although translocations are generally undertaken under full Recovery Plans, the many threats to the wild population of this taxon indicates that the development of a translocation proposal is required within the time frame of this IRP. This will be coordinated by the SRTFCRT. 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. Monitoring of the translocation is essential and will occur during the flowering period of the taxon.

Action: Undertake and monitor translocation
Responsibility: CALM (CALMScience, Perth District), and BGPA through the SRTFCRT
Cost: $5,700 in first year and $4,000 in subsequent years

14. Write full Recovery Plan

At the end of the three-year term of this Interim Recovery Plan, the need for further recovery will be assessed. If the taxon is still ranked Critically Endangered, a full Recovery Plan will be written to describe action required for long-term maintenance of the taxon. A full Recovery Plan will be prepared with the benefit of the knowledge gained over the time frame of this Interim Recovery Plan.

Action:	Write full Recovery Plan
Responsibility:	CALM (Perth District) through the SRTFCRT
Cost:	$18,100 for Year 3

4. TERM OF PLAN

This Interim Recovery Plan will operate from July 2000 to June 2003 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

5. ACKNOWLEDGMENTS

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

Andrew Battye	Botanic Garden and Parks Authority
Kingsley Dixon	Assistant Director, Botanic Garden and Parks Authority
Rebecca Evans	CALM Swan Region Project Officer, previously CALM WA Threatened Species and Communities Unit
Leonie Monks	Research Scientist, CALMScience
Stephen Michael King	Forest Ranger, CALM Perth District

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7. TAXONOMIC DESCRIPTION

Hoffman and Brown (1998)
Epiblema - Babe in the Cradle

This genus consists of a single species with two varieties, both of which are endemic to the lower south-west of Western Australia.

In general appearance *Epiblema* flowers resemble those of the Sun Orchids*, Thelymitra*, as the labellum has a similar shape to the petal and sepals. The column shape however, is quite different. The labellum has a distinctive cluster of ribbon-like appendages and its flowers show no reaction to increases in temperature.

Epiblema grandiflorum var. *grandiflorum* is recognised by its long, narrowly rounded leaf and attractive purple flowers, each of which has a distinctive cluster of ribbon-like appendages near the base of its petal-like labellum. Other prominent features include its broadly-winged column and its late flowering period which starts near the end of November and continues well into January.

The obvious feature which distinguishes *Epiblema grandiflorum* var. *cyaneum* from the Babe in the Cradle, *Epiblema grandiflorum* var *grandiflorum,* is its delicate pale blue colour. Otherwise both orchids are similar in shape and share the same habitat requirements.

Adapted from the description for *Epiblema grandiflorum* var. *grandiflorum* in Jones (1988).

Leaf to 18 cm x 10 mm, linear, terete, dark green, very stiff, held erect. Flower stem to 60 cm tall, stiff and wiry, with two closely sheathing bracts, bearing two to eight blue dark spotted flowers to 35 mm across. Perianth segments to 20 mm x 12 mm, widely spreading, overlapping at the base, firm textured with darker veins and blotches. Dorsal sepal erect or recurved. Lateral sepals obliquely deflexed, divergent. Petals spreading or recurved. Labellum to 20 mm x 12 mm, ovate, flat or concave, petal-like, shortly stalked at the base. Lamina glands absent but there are two (separate or fused into one) rounded appendages at the base, together with a tuft of ribbon-like appendages which have white, clubbed tips. The column is broadly winged from near the base, the wings extending above the anther.