INTERIM RECOVERY PLAN NO. 21

WESTERN WOOLLY CYPHANTHERA

(*CYPHANTHERA ODGERSII* SUBSP. *OCCIDENTALIS)*

INTERIM RECOVERY PLAN

1999-2002

by

Rebecca Evans and Andrew Brown

Photograph: Kate Brown

April 1999

Department of Conservation and Land Management
Western Australian Threatened Species and Communities Unit
PO Box 51, Wanneroo, WA 6946.

Natural Heritage Trust
Helping Communities Helping Australia

Department of Conservation and Land Management

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This Interim Recovery Plan will operate from April 1999 to March 2002 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still 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 1 April 1999. 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 April 1999.

SUMMARY

Scientific Name: ***Cyphanthera odgersii* subsp. *occidentalis***
Common Name: Western Woolly Cyphanthera
Family: Solanaceae
Flowering Period: September -December
CALM Region: Wheatbelt
CALM District: Merredin
Shire: Wyalkatchem
Recovery Team: Merredin District Threatened Flora Recovery Team (MDTFRT)

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; Grieve, B.J. and Blackall, W.E. (1982). *How to Know Western Australian Wildflowers IV*: 610. University of Western Australia Press; Haegi, L. (1981). A Conspectus of Solanaceae Tribe Anthocercideae. *Telopea 2(2)*: 178. NSW.

Current status: *Cyphanthera odgersii* subsp. *occidentalis* was declared as Rare Flora in November 1997 and ranked as Critically Endangered in November 1998 under World Conservation Union (IUCN) Red List Criterion C2b (IUCN 1994). The subspecies has in the past been recorded from two locations (north of Cowcowing and near Mollerin siding) over a distance of some 70 km. Recent searches for the subspecies in the Lake Moore/Mollerin area were not successful. There is some evidence to suggest that the collection information is not accurate and the location is actually near Cowcowing. In 1999, just one population consisting of 3 subpopulations is known north of Cowcowing on rail reserve and adjacent private land. Plant numbers are in rapid decline and in subpopulation 1a have dropped from 202 plants in 1994 to 147 plants in 1999. The main threats are senescence, railway and fire break maintenance, weeds, inappropriate fire, chemical drift and poor genetic diversity.

Habitat requirements: *Cyphanthera odgersii* subsp. *occidentalis* occurs in pale orange sand with a thin clay crust, supporting tall mallee over disturbed scrub. Associated species include*; Acacia yorkrakinensis* subsp. *acrita*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Grevillea pterosperma*, *Keraudrenia integrifolia*, *Waitzia acuminata* var. *acuminata*. The subspecies is likely to be geographically restricted.

Existing Recovery Actions
1. Westrail and adjacent land managers have been made aware of the subspecies and its location.
2. DRF markers have bee installed on the rail reserve.
3. 1000 seeds have been collected and are stored in CALM's Threatened Flora Seed Centre (TFSC).
4. KPBG has propagated the subspecies and a few plants are held in their Threatened Flora frames.
5. Research on the population dynamics and fire response of *Cyphanthera odgersii* subsp *occidentalis* has started.
6. CALMScience has written a translocation proposal.
7. Staff from CALM's Merredin District regularly monitor the population.

IRP Objective: The objective of this Interim Recovery Plan is to abate identified threats and maintain a viable *in situ* population to ensure the long-term preservation of the subspecies in the wild.

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

Recovery actions

1. Liaise with Westrail and private landowner.	7. Develop a translocation proposal.
2. Fencing.	8. Obtain biological and ecological information.
3. Monitor population.	9. Conduct further surveys.
4. Undertake weed control.	10. Develop a fire management strategy.
5. Collect seed and cutting material.	11. Promote awareness.
6. Propagate stock plants for translocation**.**	12. Write a full Recovery Plan.

1. BACKGROUND

History

In 1990 F. Mollemans surveyed for this subspecies in the two known collection sites (near Cowcowing railway siding and Mollerin railway siding). Approximately 200 mature plants were found on the rail reserve at Cowcowing but no plants could be located at the Mollerin site. It is possible that the collection information for the Mollerin site is incorrect and the collection was in fact from the Cowcowing site. This seems possible given the similarity of physical features at the two locations. Between 1992 and1996 a number of people have looked for this taxon in areas of suitable habitat in the Cowcowing area. Searchers include M. Fitzgerald, R. Clifton, D. Mitchell, R. Storer, C. Welbon, Kalannie-Goodlands LCDC volunteers R. Safstrom and D. True. No new populations were located during these surveys. *Cyphanthera odgersii* subsp. *occidentalis* is currently known from a single population at Cowcowing.

Description

Cyphanthera odgersii subsp. *occidentalis* is a greyish shrub to 2.5 m high by 2 m across with branches and leaves that are covered in dense short hairs 1-6.5 mm long. These hairs are more or less felted together. The thick, broad leaves are 18-35 mm long by 7-13 mm wide. The flowers are white with purple striations and occur in dense clusters. *C. odgersii* subsp. *occidentalis* differs from subspecies *odgersii* in having larger leaves and longer hairs on the branches. It also occurs to the west of subspecies *odgersii*. This latter feature is alluded to in its subspecific name ‘occidentalis’ which means western.

Distribution and habitat

In the past, *Cyphanthera odgersii* subsp. *occidentalis* has been found near Cowcowing and Mollerin but is now known from a single population at Cowcowing. Habitat is orange sandy soils with clay overlying crust, derived from red-brown sandy and clayey soils. Vegetation is disturbed (cleared during railway operations) *Eucalyptus* woodland with scattered shrubs including *Acacia yorkrakinensis* subsp. *acrita*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Grevillea pterosperma*, *Keraudrenia integrifolia*, *Waitzia acuminata* var. *acuminata*. The subspecies is likely to be geographically restricted.

Biology and ecology

It is suspected that the subspecies is a relatively short-lived disturbance opportunist and in 1999 47 dead plants were found which appear to be due to natural senescence. The single known population is found in disturbed sites and does not encroach into adjoining undisturbed areas.

Laboratory tests have given 73% germination with smoke water and growth hormones however further tests will indicate which is the limiting factor. Subjective tests have been made on plant health and the initial results show that most of the population is in poor health, with few stems and little foliage cover. These results are yet to be fully analysed.

Threats

This subspecies is ranked as Critically Endangered under World Conservation Union (IUCN) Red List Criterion C2b (IUCN 1994) due to there being a single, highly threatened, population with plant numbers in serious decline. The main threats are senescence, railway and fire break maintenance, weeds, fire, chemical drift and limited genetic diversity.

- **Rail maintenance** has impacted on the population in the past and spraying, grading and other rail maintenance activities are a continuing threat. Relevant authorities have been informed of the population and appropriate protective measures have been implemented.

- **Firebreak maintenance** may impact on this population within private property as plants occur on a firebreak. The private landowner has been informed of the presence of the subspecies and its Critically Endangered status.

- **Weeds** are a threat to the rail reserve population.

- **Inappropriate fire regimes are** adversely affecting the viability of the population. Seed of *C. odgersii* subsp. *occidentalis* probably germinates following fire and occasional fires are needed for recruitement. No natural fire has occurred in the area of the population in recent times.

Summary of population information and threats

Pop. No & Location.	Land Status	No. of plants.	Condition	Threats
1a North of Cowcowing	Rail Reserve	1994 - 202 1999 - 147	Moderate	Rail maintenance, weeds, fire, degraded habitat
1b North of Cowcowing	Private property	1990 - 2	Moderate	Firebreak maintenance, weeds, fire
1c North of Cowcowing	Rail Reserve	1991 - 26	Moderate	Rail maintenance, weeds, fire, lack of associated species

Note: There were 47 dead plants in subpopulations 1a and c in 1999.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

The objective of this Interim Recovery Plan is to abate identified threats and maintain a viable *in situ* population to ensure the long-term preservation of the subspecies in the wild.

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

3. RECOVERY ACTIONS

Existing recovery actions

Land managers have been made aware of the location and Critically Endangered status of this subspecies.

Westrail installed DRF markers on the rail reserve in 1991, no other markers are required.

More than 1000 seeds were collected during 1997-1998 and are stored in the TFSC. An initial germination rate of 74% was recorded.

Germinants produced by the TFSC were given to KPBG. Unfortunately due to 'damping-off' there are less than 10 seedlings left. There are currently five adult plants at KPBG, which were propagated from cuttings collected by KPBG.

CALMScience is conducting a research project aiming at understanding more about the soil seed bank and fire response of the subspecies. These investigations also aim to determine if short seed life and predation are influencing the regeneration of the subspecies.

A translocation proposal has been written by CALMScience and a possible translocation site has been chosen in the Walk Walkin Nature Reserve.

Staff from CALM's Merredin District Office are regularly monitoring the population.

Future recovery actions

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

1. Liaise with Westrail and private landowner

CALM Merredin District staff will liaise with Westrail engineers, rail maintenance staff and the landowner to ensure the safety of the population.

Action: Liaise with Westrail and private landowner
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $500 per year.

2. Fencing

Westrail has agreed to fence subpopulations 1a and 1c in 2000.

Action: Fence subpopulations 1a and 1c.
Responsibility: Westrail, CALM (Merredin District) through the MDTFRT
Cost: $1,790 in the second year.

3. Monitor population

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

The population will be inspected annually.

Action: Monitor population
Responsibility: CALM (Merredin District) through the MDTFRT and Westrail
Cost: $300 per year.

4. Undertake weed control

Adult plants of *Cyphanthera odgersii* subsp. *occidentalis* are coping with some competition from weeds but the population does not extend into adjacent densely weedy areas. CALM will implement a weed control progam which will involve:

1. Selection of an appropriate herbicide after determining which weeds are present.
2. Controlling invasive weeds by hand removal or spot spraying around *Cyphanthera odgersii* subsp. *occidentalis* plants when weeds first emerge.
3. Scheduling weed control to include spraying at other threatened flora populations within the district.

The tolerance of associated native plant species to herbicide at the site of *Cyphanthera odgersii* subsp. *occidentalis* is not known and it is recommended that weed control programs are undertaken in conjunction with research (see 8).

Action: Undertake weed control
Responsibility: CALM (Merredin District, CALMScience) through the MDTFRT
Cost: $800 per year.

5. Collect seed and cutting material

Preservation of germplasm is essential to guard against extinction if the wild population is lost. Seed and cutting collections are needed to propagate plants for translocations (see 6). Some seed of *Cyphanthera odgersii* subsp. *occidentalis* is currently held in CALM's TFSC, however further seed and cutting collections from as many plants as possible are needed.

Action: Collect seed and cutting material
Responsibility: CALM (TFSC, Merredin District) through the MDTFRT
Cost: $2,500 per year.

6. Propagate plants for translocation

The propagation of plants for translocation is essential as the subspecies is in serious decline in the wild. Collection of seed and cutting material is covered in recovery action 5.

Action: Propagate plants for translocation
Responsibility: KPBG, CALM (Merredin District) through the MDTFRT
Cost: $3,850 per year.

7. Develop a translocation proposal

Background 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*. Translocation is considered as desirable for the conservation of a species if populations are in rapid decline. It is recommended that restocking the existing population and translocation to a more secure site be investigated with the former given priority.

Although translocations are generally undertaken under full Recovery Plans, in this case it is clearly vital to commence this course of action before a full Recovery Plan is written as it is possible to develop translocation proposals and start growing plants within the timeframe of an Interim Recovery Plan. This will be coordinated by the MDTFRT. All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Develop a translocation proposal
Responsibility: CALM (Merredin District) through the MDTFRT and KPBG
Cost: $1,000 in the third year.

8. Obtain biological and ecological information

Research designed to increase understanding of the biology of *C. odgersii* subsp. *occidentalis* will provide a scientific base for management of the subspecies in the wild. Research will include:

1. Response of *C. odgersii* subsp. *occidentalis* and its habitat to fire.
2. Role of disturbance in regeneration.
3. Pollination biology and seed set.
4. Size and viability of soil seed bank.
5. Level of invertebrate grazing or removal of seed.
6. Seed germination requirements of *C. odgersii* subsp. *occidentalis.*
7. Factors determining level of flower and fruit abortion.
8. Longevity of plants, and time taken to reach maturity.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Merredin District) through the MDTFRT
Cost: $18,000 in the first year and $16,000 in the second and third years.

9. Conduct further surveys

Further surveys supervised by CALM staff and with assistance from local naturalists and wildflower society members will be conducted during the subspecies' flowering period (September to December).

Action: Conduct further surveys
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $1,800 per year.

10. Develop a fire management strategy

The population is reaching senescence, with many plant deaths and little or no recruitment over the past few years. It is highly likely that, as the subspecies is a disturbance opportunist, it requires occasional fire to stimulate germination of soil stored seed. A fire management strategy will be developed that will ensure appropriate fire regimes.

Action: Develop a fire management strategy
Responsibility: CALM (Merredin District) through the MDTFRT, Westrail and landowner
Cost: $2,300 in the first year.

11. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Cyphanthera odgersii* subsp. *occidentalis* will be promoted to the public. This will be achieved through an information campaign using the local print and electronic media and by setting up poster displays. This is especially important as there is only one known population of the subspecies and increased awareness may result in the discovery of others.

An information sheet which includes a description of the plant, its habitat type, threats and management actions, including photos, will be produced. The preparation of a poster illustrating all Critically Endangered flora species in the District is also recommended. Formal links with local naturalist groups and interested individuals should also be encouraged.

Action: Promote awareness
Responsibility: CALM (Merredin District, Corporate Relations) through the MDTFRT
Cost: $1,400 in the first year and $380 in the second and third years.

12. Write a 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 species is still ranked Critically Endangered a full Recovery Plan will be prepared with the benefit of knowledge gained over the period of this Interim Recovery Plan.

Action: Write a full Recovery Plan
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $17,500 once, in the third year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from April 1999 to March 2002 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked as 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:

Mr. Alex Agafonoff	Conservation Officer, CALM Merredin District
Ms. Kate Brown	Botanist, previously CALM Threatened Flora Seed Centre
Ms. Anne Cochrane	Manager, CALM Threatened Flora Seed Centre
Dr. Kingsley Dixon	Assistant Director, Kings Park and Botanic Garden
Ms. Sophie Juszkiewicz	Propagator, Kings Park and Botanic Garden
Ms. Leonie Monks	Research Scientist, CALMScience
Ms. Diana Papenfus	Botanist, previously CALMScience
Ms. Sue Patrick	Senior Research Scientist, CALMScience
Ms. Gillian Stack	Project Officer, CALM W.A. Threatened Species and Communities Unit
Mr. Darren Touchell	Research Scientist, previously Kings Park and Botanic Garden
Ms. Rebecca Wolstenholm	previously Conservation Officer, CALM Moora District

We would like to thank the staff of the W.A. Herbarium for allowing us access to the Herbarium database and specimen information, and the staff of CALM's Wildlife Branch for their invaluable assistance.

6. REFERENCES

Brown, A., Thomson-Dans, C. and Marchant, N. (eds.). (1998). *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia.

CALM (1995). Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. Department of Conservation and Land Management, Western Australia.

Fitzgerald M. (1996) 'Fencing of *Cyphanthera odgersii* subsp. *occidentalis,* TP 24-26/02, Wyalkatchem-Muckinbudin Rail Line, letter to Westrail in CALM File 022329 F3703, pp 19-22.

Grieve, B.J. and Blackall, W.E. (1982). *How to Know Western Australian Wildflowers IV*: 610. University of Western Australia Press.

Haegi, L. (1981). A Conspectus of Solanaceae Tribe Anthocercideae. *Telopea 2(2)*: 178. NSW.

World Conservation Union (1994). IUCN red list categories prepared by the IUCN Species Survival Commission, as approved by the 40th meeting of the IUCN Council Gland, Switzerland.

Lynch, J.F. (1987). Responses of breeding bird communities to forest fragmentation. Pp 123-40 in *Nature Conservation: The Role of Remnants of Native Vegetation*. ed by D.A. Saunders, G.W. Arnold, A.A. Burbidge and A.J.M. Hopkins. Surrey Beatty and Sons, Chipping Norton, N.S.W.

Saunders, D.A.; Arnold, G.W.; Burbidge, A.A. and Hopkins, A.J.M. (1987). The role of remnants of native vegetation in nature conservation: future directions. Pp 387-92 in *Nature Conservation: The Role of Remnants of Native Vegetation*. ed by D.A. Saunders, G.W. Arnold, A.A. Burbidge and A.J.M. Hopkins. Surrey Beatty and Sons, Chipping Norton, N.S.W.

Taylor, S.G. (1987). Conservation strategies for human dominated landscapes: the South Australian example. Pp 313-22 in *Nature Conservation: The Role of Remnants of Native Vegetation*. ed by D. A. Saunders, G. W. Arnold, A. A. Burbidge and A. J. M. Hopkins. Surrey Beatty and Sons, Chipping Norton, N.S.W.

7. TAXONOMIC DESCRIPTION AND KEY TO SUBSPECIES

Previously known as *Anthocercis odgersii* (F. Mueller, *Fragm. Phytogr. Austral*. *10*: 19 (1876).

Cyphanthera odgersii. **Purdie R.W. (1982).** Shrub to 2.5 m, greyish. Branches densely woolly-tomentose with mainly branched, non-glandular hairs. Leaves broadly to narrowly ovate-elliptic, almost sessile, 11-35 mm long 7-13 mm wide, woolly-tomentose. Flowers in dense clusters, often forming leafy spikes; pedicels 0.5-2 mm long. Calyx 4-7 mm long, pubescent in lower half, woolly above. Corolla 5.5-8.5 mm long, sparsely pubescent outside, densely pubescent inside, white, the striations purple; lobes ovate to broadly ovate, 1.3-2.5 mm long. Stamens 1.3-3 mm long. Capsule ellipsoid to ovoid, 3-5 mm long. Seeds 2.8-3.4 mm long.

Widespread, but uncommon, in southern W.A. Occurs on sand plains and sand dunes.

***Cyphanthera odgersii* subsp. *occidentalis*:** Shrub to 2.5 m. Hairs on branches 1-6.5 mm long. Leaves 18-35 mm long. Corolla lobes broadly ovate, 1.3-1.8 mm long. Filaments pubescent at base with non-glandular hairs only.

Known from only 2 localities in the central wheatbelt of south-western W.A. Grows on sandplains.

Subspecies key. Haegi, L. (1981).

Leaves with length:breadth ratio of 1.1-2.0, 11-20 x 7-11 mm; indumentum of branches 0.3-2.0 mm long; corolla lobes 2.0-2.5 mm long; stamen bases pubescent with eglandular and glandular hairs [Western Australia: Helms District of Eremaean Province and Southwestern Interzone] subsp. **odgersii**

Leaves with length:breadth ratio of 2.3-3.8, 18-35 x 8-13 mm; indumentum of branches 1.0-6.0 mm long; corolla lobes 1.3-1.8 mm long; stamen bases pubescent with eglandular hairs only [Western Australia: Avon District of Southwestern Province and Austin District of Eremaean Province] subsp. **occidentalis**