INTERIM RECOVERY PLAN NO. 38

MILKY EMU BUSH

(EREMOPHILA LACTEA)

INTERIM RECOVERY PLAN

1999-2002

by

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Photograph: A.P. Brown

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Natural Heritage Trust
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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This Interim Recovery Plan will operate from June 1999 to May 2002 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is no longer ranked as 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 September 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 June 1999.

SUMMARY

Scientific Name: ***Eremophila lactea***
Common Name: Milky Emu Bush
Family: Myoporaceae
Flowering Period: September – November
CALM Region: South Coast
CALM District: Esperance
Shire: Esperance
Recovery Team: Not yet formed

Illustrations and/or further information: Chinnock (1985). Five endangered new species of Myoporaceae from south-western Australia. *Nuytsia 5* (3): 391-400; Blackall and Grieve (1988) *How to Know Western Australian Wildflowers* I, 2nd ed.: 56. University of Western Australia Press, Perth; Brown *et al* (Eds). (1998). *Western Australia's Threatened Flora*: 85. Department of Conservation and Land Management, Western Australia.

Eremophila lactea is an erect spindly shrub to 3.5 m tall that often has drooping branches when old. The two-three lipped flower tube is very pale and densely glandular-hairy on the outside, while inside the tube is deeper lilac with purple spots and contains long soft hairs. *E. lactea* is allied to *E. psilocalyx*, but has thinner, broader leaves, a milky exudate on the branches and leaves, smaller sepals and a smaller, glandular-pubescent corolla.

Current status: *Eremophila lactea* was Declared as Rare Flora in October 1996, and ranked as Critically Endangered in November 1998. It currently meets World Conservation Union (IUCN) Red List Criterion B1+2e (IUCN 1994), due to the fragmented nature of populations and a continuing decline of mature individual plants. The species is probably naturally rare, as it has only ever been recorded from a very small area of distribution. This rarity has been exacerbated by the extent of clearing for agriculture in the Esperance area. Only 547 adult plants are known from four road reserve populations, which are threatened by road maintenance, inappropriate fire regimesand illegal collection of cutting material.

Habitat requirements: *Eremophila lactea* is endemic to the Esperance area of Western Australia, where it occurs over a range of approximately 15 km in disturbed habitat (following grading) on low lying sandy-loam flats. Habitat is *Eucalyptus* (including mallee) woodland over a range of shrubs including *Eremophila chamaephila*, *Westringia rigida* and *Grevillea plurijuga*.

Existing Recovery Actions: The following recovery actions have been or are currently being implemented -
1. Surveys for new populations have been conducted.
2. Land managers have been notified of the presence of *Eremophila lactea.*
3. Seed has been placed in storage and 3 plants are in cultivation.
4. Declared Rare Flora (DRF) markers have been installed.
5. Regular monitoring of all populations is being undertaken.

IRP Objective: The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species 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. Monitor populations.	5. Conduct further surveys.
2. Obtain biological and ecological information.	6. Disseminate information.
3. Collect seed.	7. Write a full Recovery Plan.
4. Develop a fire management strategy.	

1. BACKGROUND

History

Eremophila lactea was first collected by T. Loffler in 1967. R. Chinnock made further collections in 1978 from over a distance of 12 km in the same area. Chinnock then searched widely over several seasons, but did not find any additional populations. A further population was found in 1997.

In 1997 one plant died following the taking of cutting material by unknown person/s, and in 1998 a much larger number of plants had cuttings taken. Several were killed by the severity of the pruning. It has not yet been possible to determine the party responsible.

Seed was collected in 1998 and is stored in CALM's Threatened Flora Seed Centre (TFSC). Several plants are in cultivation at Kings Park and Botanic Garden (KPBG).

Road maintenance occurred between September 1998 and February 1999 and the number of plants counted in February was slightly lower than that counted in September. It is therefore likely that plants were killed during the roadworks.

Description

Eremophila lactea is an erect spindly shrub to 3.5 m tall that often has drooping branches when old. The branches are ribbed towards the apex and prominently white-blotched on the upper parts. The leaves are elliptic, from 10-31 mm long and 2-6 mm wide. These overlap each other and wrap around the branch, often obscuring it. Lilac flowers are borne on flattened stalks with three or four per axil. The two-three lipped flower tube is very pale and densely glandular-hairy on the outside, while inside the tube is deeper lilac with purple spots and contains long soft hairs. *E. lactea* is allied to *E. psilocalyx*, but has thinner, broader leaves, a milky exudate on the branches and leaves, smaller sepals and a smaller, glandular-pubescent corolla.

Distribution and habitat

Eremophila lactea is restricted to a range of less than 15 km, in disturbed road reserves north of Esperance. Habitat is low-lying sandy-loam flats supporting open *Eucalyptus* woodland and a range of shrubs including *Eremophila chamaephila*, *Westringia rigida* and *Grevillea plurijuga*.

Biology and ecology

Much remains unknown about the biology and ecology of *Eremophila lactea*, however it does appear to be a disturbance opportunist as all known populations are in disturbed road reserves. The species is thought to be pollinated by a native wasp as these have been seen on the flowers.

Threats

Eremophila lactea was Declared as Rare Flora in October 1996, and ranked as Critically Endangered in November 1998. It currently meets World Conservation Union (IUCN) Red List Criterion B1+2e (IUCN 1994), due to the fragmented nature of populations and a continuing decline of mature individual plants. The species is probably naturally rare, as it has only ever been recorded from a very small area of distribution. This rarity has been exacerbated by the extent of clearing for agriculture in the Esperance area. Only 547 adult plants are known from four road reserve populations, which are threatened by road maintenance, inappropriate fire regimes and illegal collection of cutting material.

- **Road maintenance and private property access** could both impact on *Eremophila lactea* as well as its habitat. Threatening processes include grading the road reserve, constructing drainage channels and widening private property access at Population 2.

- **Inappropriate fire regimes** may adversely affect the viability of populations. Seed of *Eremophila lactea* appears to germinate following fire or disturbance and it is likely that occasional fires are needed for recruitment. However, the soil seed bank would be depleted if fires recurred before regenerating or seedling plants reached maturity.

- **Cuttings** were illegally taken from at least one plant in 1997 and a much larger number of plants in 1998. The party responsible is unknown, as is the reason for taking the material. The severity of damage from the taken of cuttings varies between plants, with some plants being killed by the removal of all branches to a height of approximately 30 cm above ground.

Summary of population information and threats

Pop. No. & Location	Land Status	Date / No. of Plants	Condition	Threats
1. North of Esperance	Shire Road Reserve	1997 325 (129) 1998 296 (38) 1999 314	Healthy	Road maintenance, inappropriate fire, excessive cuttings being taken
2. North of Esperance	Shire Road Reserve	1997 25 1998 27	Healthy	Road maintenance, private property access maintenance, inappropriate fire
3. North of Esperance	Shire Road Reserve	1997 172 (21) 1998 167 (19)	Healthy	Road maintenance, inappropriate fire
4. North of Esperance	Shire Road Reserve	1997 37 (2) 1998 39	Healthy	Road maintenance, inappropriate fire

Number of Plants = the number of adult plants. () = number of seedlings.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species 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

The Shire of Esperance was formally notified of the Declared Rare status of *Eremophila lactea* and the location of Populations 1, 2 and 3 on their lands in October 1996, as were the land managers of private property adjacent to those populations. A notification letter was sent to the Shire of Esperance in July 1997 informing of the discovery of Population 4. Notification letters were sent to the adjacent land managers in December 1997. All notification letters detailed the legal obligations associated with the Declared Rare status of the species.

Staff from CALM's TFSC collected 900 seeds from 50 plants in Population 3 during January 1997. All are in storage at -18°C. Initial germination tests resulted in 70% germination. This species has been in cultivation in Adelaide since at least 1985. KPBG has experienced limited success with propagating the species from cuttings and, as of May 1997, hold 3 plants in their Nursery.

DRF markers have been installed at all populations. These markers alert people working in the area to the presence of the threatened flora and help prevent accidental damage during maintenance operations. The significance of these markers is being promoted to relevant bodies such as Shires, Main Roads WA (MRWA), Westrail and the Bush Fires Board. Dashboard stickers and posters illustrating DRF markers, stating their purpose and providing a contact telephone number if one is encountered, have been produced and distributed.

CALM's Esperance District has raised the issue of cuttings being taken with local wildflower pickers but the person (s) responsible have not been identified.

Staff from CALM's Esperance District and Threatened Species and Communities Unit regularly monitor all populations, coordinate recovery actions and will evaluate the performance of this recovery plan as it is being implemented. Once formed, the Esperance District Threatened Flora Recovery team will take over these responsibilities.

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. Once formed, the Esperance District Threatened Flora Recovery team will oversee the implementation of recovery actions prescribed in this IRP, and report annually to CALM's Corporate Executive.

1. Monitor populations

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

Action: Monitor populations
Responsibility: CALM (Esperance District)
Cost: $470 p.a. for 1999, 2000 and 2001.

2. Obtain biological and ecological information

Research designed to increase the knowledge of the biology and ecology of the species will provide a scientific basis for management of *Eremophila lactea* in the wild. Research will include:

1. Investigation of the species' pollination biology.
2. Study of the soil seed bank and the role of various factors (disturbance, competition, rainfall, grazing) in recruitment and seedling survival.
3. Longevity of plants and time taken to reach maturity.
4. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Esperance District)
Cost: $18,430 p.a. for 1999, 2000 and 2001.

3. Collect seed

Preservation of germplasm is essential to guard against extinction if wild populations are lost. Seed collections are needed to propagate plants for translocations.

Action: Collect seed
Responsibility: CALM (TFSC, Esperance District)
Cost: $4,280 p.a. for 1999 and 2001.

4. Develop a fire management strategy

Little is known about the effects of fire on this species, however, given that it appears to be a disturbance opportunist (see Biology and ecology), it is likely that it requires occasional fire for recruitment from soil-stored seed. Frequent fires during the flowering and seeding phase (June-January) may, on the other hand, be detrimental to the long-term survival of the species. Fire also promotes the introduction and proliferation of weed species.

Action: Develop a fire management strategy
Responsibility: CALM (Esperance District), relevant authorities
Cost: $2,400 for 1999.

5. Conduct further surveys

Further surveys supervised by CALM staff, and with the assistance of volunteers from the local community, Wildflower Society, Naturalist Club and other community-based groups, will be conducted for *Eremophila lactea* during its flowering period (September-November). Private property will also be surveyed where possible.

Action: Conduct further surveys
Responsibility: CALM (Esperance District)
Cost: $1,770 p.a. for 1999 and 2001; $380 for 2000.

6. Disseminate information

The importance of biodiversity conservation and the protection of *Eremophila lactea* 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 populations of the species are small and all are highly threatened, 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 will be produced. The preparation of a poster illustrating all Critically Endangered flora species in the District is recommended. Formal links with local naturalist groups and interested individuals will also be encouraged.

Action: Disseminate information
Responsibility: CALM (Esperance District, Corporate Relations Division)
Cost: $940 for 2000; $380 p.a. for 1999 and 2001.

7. 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 (Esperance District) through the EDTFRT
Cost: $14,640 for 2001.

4. TERM OF PLAN

This Interim Recovery Plan will operate from June 1999 to May 2002 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is no longer ranked as Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

5. ACKNOWLEDGEMENTS

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

Ms Rebecca Evans	Project Officer, CALM W.A. Threatened Species and Communities Unit
Mr Bernie Haberley	Wildlife Officer, CALM Esperance District
Ms Sophie Juszkiewicz	Propagator, Kings Park and Botanic Garden
Ms Leonie Monks	Research Scientist, CALMScience

Thanks also to CALMScience staff for providing access to Herbarium databases and specimen information, and the staff of CALM's Wildlife Branch for extensive assistance.

6. REFERENCES

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7. TAXONOMIC DESCRIPTION (Chinnock, 1985)

Eremophila lactea is an erect compact or spindly shrub 1-3.5 m high, often weeping when old. *Branches* erect, subterete and ribbed towards apex, terete in older parts, green becoming light brown in woody parts, non-tuberculate, glabrous, obscurely glandular-papillose, prominently white-blotched at least in upper parts, the blotches consisting of dried exudate. *Leaves* sessile, alternate, erect, overlapping and normally obscuring branch, (7)10-31(44) x 2-6(11) mm, elliptic to oblanceolate, acute, margins entire, surfaces smooth or obscurely glandular-papillose, glabrous, viscid when immature, white-blotched at least towards branch tips, somewhat shiny. *Flowers* 3 or 4 per axil; pedicel 2-3 mm long, flattened, sparsely glandular-pubescent in upper part, often white blotched. *Sepals* 5, valvate, green, oblong to oblanceolate, 3-5.5(8) x 0.5-1.5 mm, acute often broadly so, veins prominent after flowering, sparsely glandular pubescent on both surfaces. *Corolla* 8-13.5 mm long, very pale lilac outside, deeper lilac and faintly purple spotted inside tube, 2-lipped, densely glandular-pubescent on the outside, inside of tube villous and lobes glabrous; lobes obtuse, similar in shape. *Stamens* 4, included, glabrous. *Ovary* ovoid c. 1.5 x 0.8 mm, pale greenish yellow, bilocular with one ovule per loculus, densely villous except for swollen glabrous base; style glabrous except for a few scattered eglandular hairs towards base. *Fruit* dry, ovoid-cylindrical, 3-3.5 x 1.5-2 mm, acute, crustaceous, villous, hairs eglandular. *Seed* unknown.

Affinities. Allied to *Eremophila psilocalyx* F. Muell. (syn. *E. pachyphylla* Diels) but differing in having thinner, broader leaves, a milky exudate on the branches and leaves, smaller sepals and a smaller, glandular-pubescent corolla.