INTERIM RECOVERY PLAN NO. 32

PUNGENT JACKSONIA
(JACKSONIA PUNGENS MS)

INTERIM RECOVERY PLAN

1999-2002

by

Rebecca Evans and Val English

Photo: Rebecca Wolstenholm

June 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This Interim Recovery Plan will operate from May 1999 to April 2002 but will remain in force until withdrawn or replaced.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 10 October 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 May 1999.

SUMMARY

Scientific Name: ***Jacksonia pungens*** **ms**
Common Name: Pungent Jacksonia
Family: Papilionaceae
Flowering Period: October to November (December)
CALM Region: Midwest
CALM District: Moora
Shire: Coorow
Recovery Team: Moora 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; Chappill, J. (1998) Taxonomic Description - *Jacksonia pungens* Chappill sp. nov., unpublished.; Elliot, W.R. and Jones, D.L. (1990). *Encyclopaedia of Australian Plants Suitable for Cultivation* 5: pp. 463, Lothian Publishing Co., Melbourne; Western Australian Herbarium (1998). FloraBase - Information on the Western Australian Flora. Department of Conservation and Land Management, Western Australia; http://www.calm.wa.gov.au/science/.

Current status: *Jacksonia pungens* ms was declared as Rare Flora in November 1997 and ranked as Critically Endangered (CR) in 1998. It currently meets World Conservation Union (IUCN) Red List category 'CR' under criteria A1+2bc, C2a (IUCN 1994) due to the continued habitat degradation and decline in plant numbers.

Weed invasion and fire threaten all populations, but by far the largest threat is damage due to road and rail maintenance, and destruction by vehicles. Recovery actions outlined in this IRP focus on prevention of such damage, and on actions that aim at recovery of the species.

Habitat requirements: The taxon grows on yellow to brown sand or gravelly lateritic soil with quartzite over chert in tall shrubland of *Allocasuarina campestris* and *Actinostrobus* (Chappill 1998).

Existing Recovery Actions: The following recovery actions have been or are currently being implemented:
1. Seed collections and germination tests were done in 1998 and 1999.
2. All relevant authorities and land mangers have been informed of the taxon's location and importance.
3. DRF markers are in place where required.
4. An onsite meeting was held between CALM, Westrail, and the Shire of Coorow in 1997 to discuss management of the taxon.
5. An onsite meeting was held between CALM and Westrail in 1998 to discuss managing possible impacts of future maintenance works on rail lines on the taxon. Westrail then appointed a botanist to survey and mark Declared Rare Flora (DRF) on rail reserves.
6. Fifteen plants are being held in the Kings Park and Botanic Garden (KPBG) nursery.
7. The Moora District Threatened Flora Recovery Team (MDTFRT) is overseeing the implementation of this IRP.
8. Staff from CALM's Moora District monitor the populations regularly.

IRP Objective: The objective of this Interim Recovery Plan (IRP) 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.

Recovery actions:
1. Liaise with relevant authorities and private landowners.
2. Undertake weed control.
3. Develop and implement a fire management strategy.
4. Monitor populations.
5. Conduct further surveys.
6. Maintain fence at Population 2.
7. Collect seed and cutting material.
8. Propagate plants for translocation.
9. Develop a translocation proposal.
10. Obtain biological and ecological information.
11. Install signs.
12. Promote awareness.
13. Coordinate recovery actions.
14. Write a full Recovery Plan.

1. BACKGROUND

History

Jacksonia pungens ms was first collected in 1979 by C. Chapman in the Marchagee area. Dr. J Chappill (University of Western Australian) surveyed for the species between 1990 and 1995 without success. D. Papenfus located two new populations in 1996 in an extensive survey for the species in the immediate area surrounding the site of the original collection. This survey also included many of the local conservation reserves, but no populations were located in these reserves.

There are ten specimens of the taxon that were collected between 1962 and 1997 housed at the WA Herbarium. The information from these specimens indicates that the taxon was locally abundant in un-grazed areas but was geographically restricted.

Populations of *Jacksonia pungens* ms and its habitat are impacted by maintenance operations along road and rail reserves.

Description

J. pungens ms has conspicuous orange pea flowers with red markings surrounded by large persistent bracteoles, which splay open during flowering and then close over the developing fruit. Growing from 0.3 – 1 m tall and 0.4 - 1 m wide, this domed grey shrub is densely branched, with flowers scattered along pungent tipped branches. The pods are flattened, covered in downy hairs, and have woody valves that open before dehiscence (Chappill 1998).

Distribution and habitat

Pungent Jacksonia appears to be a disturbance opportunist and occurs over a range of 2-3 km. It is only known from three populations that occur on yellow to brown sand or gravelly lateritic soil with quartzite over chert. The associated vegetation is characterised by tall shrubland of *Allocasuarina campestris* and *Actinostrobus* (Chappill 1998).

Biology and ecology

Very little is known about the biology of *Jacksonia pungens,* ms or about the genus *Jacksonia* in general. Some information has been gathered about *Jacksonia pungens* ms from field observations, however.

The species is known to flower from October to November and occasionally in December. When flowering does occur, it occurs quickly and is completed within several weeks. The species is said to fruit prolifically and the seed has a high germination rate (refer 3 - Existing recovery actions). By far the most common field observation

is that *Jacksonia pungens* ms is a disturbance opportunist, growing in rip lines, graded firebreaks and the disturbed section of road and rail reserves.

The majority of the species in the genus *Jacksonia* tolerate acidic to neutral soils, and light to moderate frosts. *Jacksonia* species are commonly propagated from seed, and germinate readily after the seed coat has been removed to allow water absorption. Hardwood cuttings are another means of successful propagation (Elliot and Jones 1990).

Threats

Jacksonia pungens ms was declared as Rare Flora in November 1997 and was ranked as Critically Endangered in November 1998. It currently meets World Conservation Union (IUCN) Red List category 'CR' under criteria A1+A2bc, C2a (IUCN 1994) due to the continued habitat degradation and decline in plant numbers.

- **Road, rail and firebreak maintenance activities** threaten both plants and habitat of some populations of *Jacksonia pungens* ms. Maintenance activities such as construction of drainage channels, mowing and grading of roadside vegetation, and resleepering of rail lines have historically caused damage to populations or their habitat. It is important that liaison with the relevant authorities and landholders continues so that disturbance to the plants and their habitat is minimised.

- **Weed invasion** is a threat to all populations, especially those on rail and road reserves, but also to a lesser extent in Populations 2 and 3a that occur on private property. Weeds not only compete with adult plants for light, moisture and nutrients, but they also reduce the chance of regeneration from soil stored seed. Weeds also increase fuel loads and exacerbate the fire risk.

- **Inappropriate fire regimes** would impact the viability of populations, as seeds of *Jacksonia pungens* ms probably germinate following fire. The soil seed bank would, therefore, rapidly be depleted if fires recurred before regenerating or juvenile plants reached maturity and replenished the soil seed bank. It is likely, however, that occasional fire is needed for the reproduction of the species. Fire also generally increases weed invasion.

- **Grazing** by sheep is a possible threat to Population 2. The paddock in which the taxon is growing has previously been fenced to stop sheep grazing 'poison bush'. This fence is now in disrepair and sheep can enter the area in which *Jacksonia pungens* ms occurs.

- **Vehicles** can be driven on the batter within the road reserve at Sub-population 1c. Several plants grow on the batter close to the road shoulder and have been damaged in the past. These plants require special protection as they form a link between the population on the main road and that on the adjoining road.

- **Wildflower picking** is a minor threat at Population 1 as plants are located adjacent to a main road and the taxon is conspicuous when flowering. This population is highly threatened by weed invasion and road maintenance and wildflower picking would exacerbate these impacts.

- **Farming activities**: fence and firebreak maintenance may damage plants that are growing close to fence lines and firebreaks. Populations of *Jacksonia pungens* ms are also close enough to crops to be affected by herbicide and fertiliser applications from adjacent farmland. Liaison with farmers is needed to encourage care to avoid chemical or fertiliser drift.

Summary of population information and threats

Pop. No & Location.	Land Status	Year / No. of plants.	Condition	Threats
1a. South of Marchagee	MRWA road reserve	1996 – 85	Poor	Road maintenance, weeds, fire*
1b. South of Marchagee	MRWA road reserve	Unknown	Poor	Road maintenance, weeds, fire*
1c South of Marchagee	Shire road reserve	1996 – 3 1998 – 14+	Very poor	Wildflower picking, road maintenance, vehicles, weeds, fire*, farming activities
2. South of Marchagee	Private property	1996 – 1	Moderate	Weeds, fire*
3a. South of Marchagee	Private property	1996 – 1	Poor	Firebreak maintenance, vehicles, weeds, fire*, farming activities
3b. South of Marchagee	Shire road reserve	1996 - 1	Very poor	Road maintenance, vehicles, weeds, fire*, farming activities
3c. South of Marchagee	Rail reserve	1997 - 80	Very poor	Rail/track maintenance, vehicles, weeds, fire*

MRWA = Main Roads Western Australia; fire* = inappropriate fire regimes

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

Some 2,800 seeds were collected between January 1997 and February 1999 and are stored in CALM's Threatened Flora Seed Centre (TFSC). An initial germination rate of 95% was recorded. The germination rates after storage were 99 and 100%. The remaining seed is being stored at -18°C.

All relevant authorities and land managers have been made aware of the threatened nature of *Jacksonia pungens* ms, its location, and the need for conservation of the taxon.

DRF markers have been placed where required along main roads and rail reserves. These signal environmentally significant sites, and the need to avoid damage to vegetation between the pegs.

Moora District staff held an onsite meeting with the Coorow Shire and Westrail officials in 1997. The meeting was held to inform these authorities of the taxon's location and the need for conservation.

A further onsite meeting was held between Westrail and CALM staff about tagging of plants before a major works program on rail lines. The taxon was not in flower at the time and tagging was postponed. Westrail has subsequently employed a botanist to survey all rail reserve populations of DRF, including this taxon. Subpopulation 3c was surveyed in 1999 and re-sleepering has been postponed until a later date.

Fifteen plants were raised from rooted seedlings derived from germination tests, and these are held in the KPBG nursery.

CALM Moora District staff regularly monitor the population.

The Moora District Threatened Flora Recovery Team (MDTFRT) 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 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 relevant authorities and private landowners

CALM's Moora District staff will continue to liaise with Main Roads Western Australia and Westrail engineers and maintenance staff, and private landowners to ensure up-to-date knowledge of the taxon.

Any management action in road and rail reserves will be designed to comply with the policies and recommended practices of the Roadside Conservation Committee. These are intended to conserve the native vegetation, and in particular the habitat of significant flora and fauna.

Action: Liaise with relevant authorities and private landowners
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $1,300 in the first year, and $700 in the second and third years.

2. Undertake weed control

Weeds are a major threat to subpopulations 1a-c, 3b-c, that are located on rail and road reserves, and to a lesser extent to Populations 2 and 3a, that occur on private property. The following actions will be implemented:

1. Selection of appropriate herbicides after determining which weeds are present.
2. Controlling invasive weeds by hand removal or spot spraying around *Jacksonia pungens* ms 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 herbicides at the site of *Jacksonia pungens* ms is not known and weed control programs will be undertaken in conjunction with research (see Recovery Action 10).

Action: Undertake weed control
Responsibility: CALM (Moora District, CALMScience) through the MDTFRT
Cost: $1,200 per year.

3. Develop and implement a fire management strategy

It is likely that the species requires occasional fire for recruitment from soil stored seed, but that frequent fires would be detrimental to its long-term survival. Fire also promotes the introduction and proliferation of weed species. A fire management strategy will be developed by CALM's Moora District in consultation with relevant land managers and the Moora District Threatened Flora Recovery Team.

Action: Develop a fire management strategy
Responsibility: CALM (Moora District) through the MDTFRT, land managers and other relevant authorities
Cost: $5,800 in the first year and $3,500 in subsequent years.

4. Monitor populations

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

Action: Monitor populations
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $600 per year.

5. Conduct further surveys

Volunteers from the local community, Wildflower Societies, Naturalist Clubs and other community-based groups will be encouraged to be involved in surveys supervised by CALM staff. Surveys will be conducted during the species' flowering period (October - December).

Action: Conduct further surveys
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $2,400 per year.

6. Maintain fence at Population 2

The fence around Population 2 will be maintained to prevent grazing by sheep.

Action: Maintain fence at Population 2
Responsibility: CALM (Moora District) and private landowner through the MDTFRT
Cost: $1,800 in the first year.

7. Collect seed and cutting material

Preservation of germplasm is essential to prevent extinction if the wild population is lost. Seed and cuttings will be collected for storage and for use in propagating plants for translocations (see Recovery Action 8). Some seed of *Jacksonia pungens* ms is currently held in CALM's TFSC, and 15 clones are held in the nursery at KPBG. Further seed and cutting collections from as many plants as possible is needed, however, to maximise the genetic diversity of the material for storage and for use in translocations.

Action: Collect seed and cutting material
Responsibility: CALM (TFSC, Moora District) through the MDTFRT
Cost: $2,900 per year.

8. Propagate plants for translocation

The propagation of plants in readiness for translocation is essential as the species is in serious decline in the wild.

Action: Propagate plants for translocation
Responsibility: KPBG, CALM (Moora District) through the MDTFRT
Cost: $3,900 in the second and third years.

9. Develop a Translocation Proposal

Translocation is essential for the conservation of this species, as the road and rail reserves and private property on which the populations occur are not secure from threats including weeds, fire and physical destruction. Although translocations are generally undertaken under full Recovery Plans, it is possible to develop a Translocation Proposal and start propagating the plants necessary within the timeframe of an Interim Recovery Plan. This will be coordinated by the MDTFRT. 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: Develop a Translocation Proposal
Responsibility: CALM (Moora District), and KPBG through the MDTFRT
Cost: $3,600 in the third year.

10. Obtain biological and ecological information

Research designed to increase understanding of the biology of *Jacksonia pungens* ms will provide a scientific basis for management of the species in the wild. Research will include:

1. Response of *J. pungens* ms and its habitat to fire.
2. Role of disturbance in regeneration.
3. Seed germination requirements of *J. pungens* ms.
4. Longevity of plants, and time taken to reach maturity.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Moora District) through the MDTFRT
Cost: $17,600 per year.

11. Install signs

Signs that indicate that the picking of wildflowers is illegal will be placed on the main road near Subpopulation 1c.

Action: Install signs
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $1,000 in the first year.

12. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Jacksonia pungens* ms 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 are only three known populations of the species and an increased awareness may result in the discovery of others.

An information sheet that includes a description of the plant, its habitat, threats, management actions, and photos will be produced. A poster illustrating all Critically Endangered flora species in the District will also be developed. Formal links with local naturalist groups and interested individuals will also be encouraged.

Action: Promote awareness
Responsibility: CALM (Moora District, Corporate Relations) through the MDTFRT
Cost: $800 in the second year.

13. Coordinate recovery actions

The Moora District Threatened Flora Recovery Team (MDTFRT) will continue to oversee the implementation of the recovery actions for *Jacksonia pungens* 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 (Moora District) through the MDTFRT
Cost: $4,600 per year.

14. 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 (WATSCU and Moora District) through the MDTFRT
Cost: $18,700 in the third year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from May 1999 to April 2002 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.

Total costs: **$137,100**
Total CALM: $41,400
Total Other: $26,400
Total NHT: $69,300

5. ACKNOWLEDGMENTS

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

Ken Atkins Principal Botanist, CALM Wildlife Conservation Section
Anne Cochrane Manager, CALM Threatened Flora Seed Centre
Jenny Chappill Botanist, University of Western Australia
Diana Papenfus Botanist, previously CALMScience
Robyn Phillimore Project Officer, CALM W.A. Threatened Species and Communities Unit
Rebecca Wolstenholm Previously Conservation Officer, CALM Moora District

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and CALM's Wildlife Branch for extensive 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 (1992). Policy Statement No. 44 *Wildlife Management Programs*. Department of Conservation and Land Management, 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, Western Australia.

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

Chappill, J. (1998) Taxonomic Description - *Jacksonia pungens* ms Chappill sp. nov., unpublished.

Elliot, W.R. and Jones, D.L. (1990). *Encyclopaedia of Australian Plants Suitable for Cultivation* 5: pp.463, Lothian Publishing Co., Melbourne.

Western Australian Herbarium (1998). FloraBase - Information on the Western Australian Flora. Department of Conservation and Land Management, Western Australia. http://www.calm.wa.gov.au/science/

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.

7. TAXONOMIC DESCRIPTION

Jacksonia pungens ms Chappill sp. nov.

Erect, densely-branching, domed, grey shrub 0.3-1 m tall, 0.4-1 m diameter, stems terete with straight, terete, pungent branchlets, flowers scattered on the long pungent branchlets, large persistent bracts at base of pedicel and large persistent bracteoles on pedicel, buds with long silky hairs on calyx, widest towards middle, strongly angular, calyx coarse, lobes splayed at flowering, becoming brittle and covering developing fruit after flowering, green to pink on inner surface, up to 12 mm long, standard and wings orange, standard with red markings, emarginate with short claw, wing orientation horizontal, apex entire or notched, keel red with raised area near base of lamina, fused for half to two thirds of the lower margin, anthers cream, pods dropped at or before dehiscence, pod pedicel straight, pods woody with downy hairs, seed yellow or green with black spots and stripes, surface smooth without cuticular wrinkles, 3 x 1.5 mm, juvenile stem terete, first leaves alternate, elliptic with dentate margin, pubescent, later leaves obovate, internodes short, scale leaves after seven nodes.

Flowering Time: October to November.

Distribution: Western Australia, Irwin District, known only from remnant populations south of Marchagee. Records from north of Marchagee are unconfirmed.

Habitat: yellow to brown sand or gravelly lateritic soil with quartzite over chert, tall shrubland with *Allocasuarina campestris*, *Actinostrobus*.