INTERIM RECOVERY PLAN NO. 23

ORANGE-FLOWERED WATTLE

(*ACACIA AURATIFLORA* MS)

INTERIM RECOVERY PLAN

1999-2002

by

Gillian Stack and Andrew Brown

Photograph: Diana Papenfus

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

Natural Heritage Trust
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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This Interim Recovery Plan will operate from May 1999 to April 2002 but will remain in force until withdrawn or replaced.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, 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 30 August 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: ***Acacia auratiflora*** **ms**
Common Name: Orange-flowered Wattle
Family: Mimosaceae
Flowering Period: June-August
CALM Region: Wheatbelt
CALM District: Katanning
Shire: Lake Grace
Recovery Team: Katanning District Threatened Flora Recovery Team (KDTFRT) to be formed in 1999

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 Department of Conservation and Land Management, Western Australia; Cowan, R.S. and Maslin, B.R. (Unpublished reference). Taxonomic Description of *Acacia auratiflora*.

Current status: *Acacia auratiflora* ms was Declared as Rare Flora in November 1997, and ranked as Critically Endangered in November 1998 under World Conservation Union (IUCN) Red List Criterion C2a (IUCN 1994). There are currently 133 plants known from four populations, all of which occur in degraded habitat. The main threats are road and rail maintenance, salinity, grazing, weeds and fire.

Habitat requirements: *Acacia auratiflora* ms is found in depressions on a plain, in grey to brown sandy clay, amongst mallee scrub or Gimlet (*Eucalyptus salubris*) woodland over *Melaleuca* thicket with grasses. The species is endemic to the Lake Grace - Newdegate area of Western Australia.

Existing Recovery Actions: The following recovery actions have been or are currently being implemented:
1. Surveys for new populations have been conducted and are continuing.
2. Land managers have been notified of the presence of *A. auratiflora* ms.
3. Declared Rare Flora (DRF) markers are installed.
4. Seed has been collected and stored at CALM's Threatened Flora Seed Centre (TFSC) and at Kings Park and Botanic Garden (KPBG).
5. All populations are regularly monitored.

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.

Recovery actions

1. Implement weed control.	6. Obtain biological and ecological information.
2. Monitor populations.	7. Start translocation process.
3. Develop a fire management strategy.	8. Promote awareness.
4. Conduct further surveys.	9. Write a full Recovery Plan.
5. Collect seed.	

1. BACKGROUND

History

The first collection of *A. auratiflora* ms was made by Paul Wilson in 1968 from the Lake Biddy area. Despite extensive searching, the species is still only known from four populations over a range of 15 km. Approximately 130 plants are known, and many of these occur on insecure road and rail reserves. Two other populations occur within an unvested Government reserve, which receives no management attention. Seed was collected from Population 3 in 1997 and is stored in CALM's Threatened Flora Seed Centre (TFSC).

Description

Acacia auratiflora ms is a spreading shrub from 30 cm to 1 m tall. Its branchlets have a light covering of golden or white hairs. The phyllodes are pale green, from 2-4 cm long and up to 7 mm wide, being widest at the middle. These may also have sparse hairs on the margins or nerves, and the nerves are often white-resinous. The flower heads are very large golden balls. Young seedpods have a covering of dense, fine, golden hairs (Cowan and Maslin, unpublished). This taxon is closely related to *A. consobrina*, but tends to be less hairy, with shorter and sparser hairs on branchlets and phyllodes. In addition, the flower heads of *A. auratiflora* ms are larger and on shorter stalks than *A. consobrina*.

Distribution and habitat

Acacia auratiflora ms is endemic to a range of less than 15 km in the Lake Grace - Newdegate area of Western Australia. It is known from four populations with a total of approximately 130 plants. They are found in depressions on a plain, in grey to brown sandy clay, amongst mallee scrub or *Eucalyptus salubris* woodland over *Melaleuca uncinata* thicket with grasses.

Biology and ecology

The biology and ecology of *Acacia auratiflora* ms is poorly known. This species appears to be a disturbance opportunist, as many plants occur on disturbed road and rail reserves.

Seed collected by TFSC staff has yielded initial germination of between 5% and 19%. This poor result may be due to the method of stimulating germination – the TFSC used boiling water in their first attempt. While this treatment is successful with most hard-seeded plants, it may have damaged the seed of this species. When germination of another sample was tested by nicking the seed coat, the result was 94% germination. Vegetative propagation has never been attempted with this species, and is a priority for 1999.

Most Australian species of *Acacia* are highly adapted to surviving fires. Germination of *Acacia* seed is often stimulated by fire but depends on the fire intensity and seed depth in the soil. A few *Acacia* species are 'soft-seeded' and are damaged by fire (Cavanagh 1987). Given the damage done to the seed by boiling water it seems possible that this is true of *A. auratiflora* ms. However, no accurate information is available about the response of *A. auratiflora* ms to fire. All populations are long unburnt.

Threats

The species is ranked as Critically Endangered under World Conservation Union (IUCN) Red List Criterion C2a (IUCN 1994) due to the low number of extant mature plants (133), the continuing decline in plant numbers and the severely fragmented distribution with no subpopulation containing more than 50 mature individuals. The main threats are road and rail maintenance, salinity, grazing, weed competition and inappropriate fire.

- **Road and rail maintenance** such as grading, construction of drainage channels and indiscriminate weed control pose a threat to both road and rail reserve populations of *Acacia auratiflora* ms. Mowing of road reserve vegetation could also affect the habitat of this species. These disturbance events also often encourage weed invasion.

- **Salinity,** although not impacting greatly at present, is expected to result in the extinction of Population 3 within a 5 to 10 year period if protective measures are not implemented. Salinity abatement is being tackled via the State salinity Action Plan.

- **Grazing** and trampling by sheep has been a threat to Population 3, as the area was sometimes used as a stock corridor. In the past, grazing has resulted in adult plants at this site becoming stunted with minimal foliage. Grazing, if allowed to continue, may result in the extinction of the population.

- **Weed invasion** from introduced grasses is a threat to Population 3. Although adult plants appear to be coping, the weeds may smother *Acacia auratiflora* ms seedlings. Weeds also increase the threat of fire by increasing the fuel load.

- **Inappropriate fire regimes** are likely to adversely affect the long-term viability of populations. Seeds of *Acacia auratiflora* ms may germinate following fire and, if so, it will be important that occasional fires occur for recruitment. However, little is currently known about the effect of fire on the seed of this species (see discussion under Biology and ecology) and research is required.

Summary of population information and threats

Pop. No. & Location	Land Status	Date / No. of Plants	Condition	Threats
1. West of Newdegate	Unvested reserve	08.95 15	Moderate	Road maintenance, grazing, inappropriate fire regimes
2. West of Newdegate	Unvested reserve	08.95 35	Moderate	Inappropriate fire regimes
3a. East of Buniche	Shire road verge	09.95 20 * 10.97 19 *	Moderate	Salinity, grazing and trampling by stock, road maintenance, weed competition, inappropriate fire regimes
3b. East of Buniche	Westrail reserve	09.95 * 10.97 *	Moderate	Salinity, grazing and trampling by stock, railway maintenance, weed competition, inappropriate fire regimes
4. West of Newdegate	Shire road verge	06.95 occasional 11.97 63	Healthy	Road maintenance, inappropriate fire regimes

* Number of plants is a combination of subpopulations 3a and 3b.

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

- Grazing and trampling by sheep has in the past been a threat to Population 3, as the area was sometimes used as a stock corridor. Land managers have been made aware of the locations and the Critically Endangered status of this species and sheep are no longer driven along this road and rail reserve.
- Road and rail maintenance such as grading, construction of drainage channels and indiscriminate weed control have posed a threat to both road and rail reserve populations. Local government authorities and Westrail have been made aware of the locations and the Critically Endangered status of this species and have been asked to avoid conducting operations in those areas where the species occurs.
- Declared Rare Flora (DRF) markers are in place for all populations.

- Seed was collected from five plants in Population 3 during November 1997, resulting in a total of 178 seeds being stored at -18°C in CALM's TFSC. Just over 4 500 seeds were collected from 24 plants in population 4 in December 1998.
- Staff from CALM's Katanning District regularly monitor all populations.
- A Threatened Flora Recovery Team has been established in the Katanning District and is overseeing the implementation of this IRP. It will include recovery progress in its annual report to CALM's Corporate Executive and funding agencies.

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. Implement weed control

Population 3 is weed infested. CALM will implement a weed control program that will involve:

1. Selection of an appropriate herbicide or method of weed control after determining which weeds are present.
2. Controlling invasive weeds by hand removal or spot spraying around individual plants of *Acacia auratiflora* ms when weeds first emerge.
3. Scheduling to include weed spraying of other DRF populations requiring weed control within the district.

The population is on land vested with the Shire of Lake Grace and Westrail. A weed control program will be developed in consultation with these authorities.

Action: Implement weed control
Responsibility: CALM (Katanning District) through the KDTFRT, relevant land managers
Cost: $1000 p.a.

2. Monitor populations

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

Action: Monitor populations
Responsibility: CALM (Katanning District) through the KDTFRT
Cost: $600 p.a.

3. Develop a fire management strategy

Little is known about the effects of fire on *Acacia auratiflora* ms but all populations are long unburnt and it is likely that the species requires occasional fire for recruitment from soil stored seed. CALM's Katanning District, in consultation with relevant land managers and the KDTFRT, will develop a fire management strategy that ensures appropriate fire regimes.

Action: Develop a fire management strategy
Responsibility: CALM (Katanning District) through the KDTFRT, relevant land managers
Cost: $1,600 for year 1 and $1,000 in subsequent years for maintenance.

4. Conduct further surveys

Further surveys supervised by CALM staff and with assistance from local naturalists and wildflower society members will be conducted during the species' flowering period (June-August). Note: this taxon looks similar to *Acacia consobrina*, which occurs in the same area.

Action: Conduct further surveys

Responsibility: CALM (Katanning District) through the KDTFRT
Cost: $1,600 p.a.

5. Collect seed

Preservation of germplasm is essential to guard against extinction if the wild population is lost. Seed collections are also needed to propagate plants for translocations (see 7). Some seed of *Acacia auratiflora* ms is currently held in CALM's TFSC. Further collections from as many plants as possible will be made and lodged in the TFSC and at KPBG.

Action: Collect seed
Responsibility: CALM (TFSC, Katanning District) through the KDTFRT, KPBG
Cost: $2,800 for years 2 and 3.

6. Obtain biological and ecological information

Research designed to increase an understanding of the biology of the species will provide a scientific base for management of *Acacia auratiflora* ms in the wild. Research will include:

1. Response of *Acacia auratiflora* ms and 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 *Acacia auratiflora* ms.
7. Factors determining level of flower and fruit abortion.
8. Longevity of plants, and time taken to reach maturity.
9. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Katanning District) through the KDTFRT
Cost: $17,000 p.a.

7. Start translocation process

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 existing populations 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 KDTFRT. All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Start translocation process
Responsibility: CALM (Katanning District, CALMScience) through the KDTFRT, KPBG
Cost: $2,100 for year 3.

8. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Acacia auratiflora* 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 four known populations of the species and increased awareness may result in the discovery of others.

An information sheet, which includes a description of the plant, its habitat type, threats, management actions and 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 be encouraged.

Action: Promote awareness
Responsibility: CALM (Katanning District, Corporate Relations Division) through the KDTFRT
Cost: $900 in year 2 and $400 in year 1 and 2.

9. 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.

Action: Write a full Recovery Plan
Responsibility: CALM (Katanning District) through the KDTFRT
Cost: $16,100 in year 3.

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, unless the taxon is no 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:

Ms Anne Cochrane	Manager, CALM Threatened Flora Seed Centre
Ms Rebecca Evans	Project Officer, CALM W. A. Threatened Species and Communities Unit
Mr Mal Graham	Senior Operations Officer, CALM Katanning District
Ms Sophie Juszkiewicz	Propagator, Kings Park and Botanic Garden
Dr Bruce Maslin	Senior Research Scientist, CALMScience
Mr Murray Mitchell	Operations Officer, CALM Katanning District
Ms Leonie Monks	Botanist, previously with CALM WATSCU
Ms Diana Papenfus	Botanist, W.A. Herbarium

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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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

This unpublished taxonomic description of *A. auratiflora* ms by R.S. Cowan and B.R. Maslin is included with kind permission from Australian Biological Resources Study (ABRS). The description was prepared as a treatment for *Flora of Australia*.

Acacia auratiflora ms is a spreading shrub 0.3-1 m tall. New shoots resinous. Branchlets sparsely to moderately appressed puberulous, the hairs golden or white. Phyllodes narrowly elliptic, acute to obtuse-mucronate, 2-4 cm long, 3-7 mm wide, coriaceous, straight to shallowly incurved basally, pale green, glabrous or sparsely appressed hairy on margins or nerves, with c. 3 main longitudinal nerves and longitudinally anastomosing secondary nerves forming an open reticulum, the nerves often white-resinous. Inflorescences rudimentary, 1-headed racemes; raceme axes c. 1 mm long, terminated by a resin-coated vegetative bud at anthesis; peduncles 1-2 mm long, golden-puberulous; heads globular, golden, 6-7 mm diam., 32-42-flowered. Flowers 5-merous; sepals united from below middle to near apex; petals golden appressed hairy. Legumes (young) densely pilose/villose, the hairs golden. Seeds n.v.

Occurs in the Lake Grace - Newdegate area, south-western WA. Grows in depressions in clay, loamy clay or sand in open scrub.

W.A.: 38.5 km E of Lake Grace towards Newdegate, B.R. Maslin 3430 (PERTH); c. 10 km W of Lake Biddy, P.G. Wilson 7169 (NY, PERTH).

A member of the "*A. flavipila* group".