INTERIM RECOVERY PLAN NO. 152

BLUNT WATTLE
(ACACIA APRICA)
INTERIM RECOVERY PLAN

2003-2008

Ben Bayliss

Photograph: Gillian Stack

June 2003

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

Government of Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (the Department) 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.

The Department 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 results from a review of, and replaces, No.22 *Acacia aprica* (Stack and English, 1999). This Interim Recovery Plan will operate from June 2003 to May 2008 but will remain in force until withdrawn or replaced.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 reviewed after five years and the need for a full recovery plan assessed.

This IRP was approved by the Director of Nature Conservation on 21 September 2003. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting The Department, as well as the need to address other priorities.

Information in this IRP was accurate at June 2003.

SUMMARY

Scientific Name:	***Acacia aprica*** (Maslin and Chapman 1999)	**Common Name:**	Blunt Wattle
Family:	Mimosaceae	**Flowering Period:**	June-August
Dept Region:	Midwest	**Dept District:**	Moora
Shire:	Coorow, Carnamah	**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.

Current status: In 1997 *Acacia aprica* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act* 1950 and is now listed as Critically Endangered (CR). It currently meets World Conservation Union (IUCN 2000) Red List Category CR under criteria B1ab(iii,v)+2ab(iii,v) (IUCN 2000) due to the high level of fragmentation of populations, and a continuing decline in the quality of the habitat. *Acacia aprica* is also listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The main threats are road, rail and firebreak maintenance activities; weed invasion; inappropriate fire regimes; grazing and chemical drift.

An Interim Recovery Plan was developed for the species in 1999 (Stack and English 1999). Information collected since that plan was completed has been incorporated into this plan and this document now replaces Stack and English (1999).

Critical habitat: The critical habitat for *Acacia aprica* comprises the area of occupancy of the known populations; similar habitat within 200 metres of known populations; corridors of remnant vegetation that link populations and additional nearby occurrences of similar habitat that do not currently contain the species but may have done so in the past and may be suitable for translocations.

Habitat critical to the survival of the species, and important populations: Given that this species is listed as Critically Endangered it is considered that all known habitat for wild and translocated populations is critical habitat.

Benefits to other species/ecological communities: There are no other known listed threatened species or ecological communities in the habitat of *Acacia aprica*. Recovery actions, such as weed control, implemented to improve the security of *Acacia aprica* are likely to improve the quality of the habitat in which the populations are located.

International Obligations: This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. However, as *Acacia aprica* is not listed under any international agreement, the implementation of other international environmental responsibilities is not affected by this plan.

Role and interests of indigenous people: There are no known indigenous communities interested or involved in the management of areas affected by this plan. Therefore no role has been identified for indigenous communities in the recovery of this species.

Social and economic impact: Some populations of *Acacia aprica* occur on private land and negotiations will continue with regard to the future management of these populations. The implementation of this recovery plan has the potential to have some limited social and economic impact, where populations are located on private property. Recovery actions refer to continued liaison between stakeholders with regard to these areas.

Evaluation of the Plan's Performance: The Department of Conservation and Land Management, in conjunction with the Recovery Team will evaluate the performance of this IRP. In addition to annual reporting on progress with listed actions and comparison against the criteria for success and failure, the plan is to be reviewed within five years of its implementation.

Habitat requirements: *Acacia aprica* is endemic to the Carnamah-Coorow area of Western Australia. It is found on gravely brown clayey sand, often with surface quartz. Plants occur in highly disturbed heath on road reserves or private property. Associated species include *Allocasuarina campestris, Acacia acuminata, Grevillea paniculata* and *Hakea scoparia*.

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

1. Relevant land managers have been notified of the presence of *Acacia aprica*..
2. Surveys have been conducted to locate new populations.

3. Markers that define these populations have been installed and maintained.
4. Seed has been collected and stored.
5. Three phases of the approved Translocation Proposal have been implemented.
6. Biological and ecological information has been obtained through surveys and experimental trials.
7. A poster that provides information and illustrates the species has been developed and distributed.
8. 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 by ten percent or more.

Criterion for failure: The number of individuals within populations and/or the number of populations have decreased by ten percent or more.

Recovery actions

1. Coordinate recovery actions
2. Map critical habitat
3. Implement weed control
4. Continue to implement translocation program
5. Attempt to stimulate germination.
6. Monitor populations.
7. Implement fire management strategy.
8. Obtain biological and ecological information
9. Collect seed and cutting material.
10. Conduct further surveys
11. Promote awareness
12. Review the need for a full Recovery Plan

1. BACKGROUND

History

The first collection of *Acacia aprica* was made in 1957 from an area south of Carnamah by J.W. Green. Surveys undertaken for this species in July 1996 and 1998 resulted in the location of six populations. In October 1999 a survey of remnant vegetation on private land by Departmental officers located a new population of around 100 plants. This population currently represents one of the largest and least disturbed of all populations identified to date. Associated with this population were 53 native plant species as well as a low abundance and number of weed species compared with road reserve populations.

A new population and subpopulation were located on August 2002 and January 2003 respectively. The appropriate land managers were notified by the Department and DRF markers installed.

Of the eight known natural populations of *Acacia aprica*, two contain 100 or more individuals. Seven contain fewer than ten plants and in one population the only known plant could not be relocated when resurveyed in January 2003. The destruction of several plants in Population 1 by vehicular activity within the road reserve was documented in December 1998.

An Interim Recovery Plan (IRP) was developed for the species in 1999 (Stack and English 1999). Information collected since that plan was completed has been incorporated into this plan and this document now replaces Stack and English (1999).

Description

Acacia aprica (Maslin and Chapman 1999) is an open multi-stemmed shrub to 2 m tall. The inflorescences are golden, globular to oblong and hang two per axil. The phyllodes are a dull medium-green, 6-14 cm long and 1-1.4 mm wide. They have eight close parallel nerves, which are of more or less of equal width. The seed pods are linear, up to 60 mm long and *ca* 2 mm wide. *A. aprica* is closely related to *A. filifolia*, which has narrower, slightly incurved rounded-quadrangular phyllodes, ovate to lanceolate bracteoles and mottled seeds (Maslin and Chapman 1999). It has also been confused with *A. merinthophora*, which it resembles in habit.

Distribution and habitat

A. aprica is endemic to the Carnamah-Coorow area of Western Australia with a range of approximately 10 km. It is currently known from 263 plants from 8 natural populations. Six of the extant populations are restricted to heavily disturbed linear road reserves, and one of about 100 plants is located in a small remnant on private land. Of the six road reserve populations, five consist of 10 plants or less. The species is found on gravely brown clayey sand, often with surface quartz. Associated species include *Allocasuarina campestris, Acacia acuminata, Grevillea paniculata* and *Hakea scoparia*.

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 occupied (continuously, periodically or occasionally) by an organism or group of organisms or once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind have the potential to be reintroduced (*Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act)).

The critical habitat for *A. aprica* ms comprises:

- The area of occupancy of known populations;
- Areas of similar habitat within 200 metres of known populations, i.e. (these provide potential habitat for natural range extension);
- Corridors of remnant vegetation that link populations (these are necessary to allow pollinators to move between populations and are usually road and rail verges);
- Areas of similar habitat that now contain translocated populations;
- Additional occurrences of similar habitat that do not currently contain the species but may have done so in the past (these represent possible translocation sites).

Habitat critical to the survival of the species, and important populations

Given that this species is listed as Critically Endangered it is considered that all known habitat for wild and translocated populations is habitat critical.

Benefits to other species/ecological communities
There are no other known listed threatened species or ecological communities in the habitat of *Acacia aprica*. However, recovery actions, such as weed control, implemented to improve the security of *Acacia aprica* are likely to improve the quality of the habitat in which the populations are located.

International Obligations

This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that Convention. However, as *Acacia aprica* is not listed under any international agreement, the implementation of other international environmental responsibilities is not affected by this plan.

Role and interests of indigenous people

There are no known indigenous communities interested or involved in the management of areas affected by this plan. Therefore no role has been identified for indigenous communities in the recovery of this species.

Social and economic impacts

Some populations of *Acacia aprica* occur on private land and negotiations will continue with regard to the future management of these populations. The implementation of this recovery plan has the potential to have some limited social and economic impact, where populations are located on private property. Recovery actions refer to continued liaison between stakeholders with regard to these areas.

Evaluation of the Plan's Performance

The Department, in conjunction with the Recovery Team will evaluate the performance of this IRP. In addition to annual reporting on progress with listed actions and comparison against the criteria for success and failure, the plan is to be reviewed within five years of its implementation.

Biology and ecology

Acacia aprica appears to be a moderate disturbance opportunist. In 1998 three young plants, (two in Population 1 and a third in Population 5), were observed growing on old grader scrapes. Many Australian species of *Acacia* are highly adapted to surviving fires, which are a regular occurrence in most Australian habitats. Germination of *Acacia* seed is often stimulated by fire but germination also depends on factors such as fire intensity and seed depth in the soil. Some *Acacia* species are 'soft-seeded' and are damaged by fire (Cavanagh 1987). No specific information is available about the response of *Acacia aprica* to fire. However, from the response of other predominantly single stemmed, non lignotuberous acacias occupying a similar ecological niche, it is likely that *Acacia aprica* would be killed by fire. In such non-sprouting species that rely on post-fire germination to persist, fire intervals which exceed the longevity of both the plants and their associated seed banks may contribute to local population decline and possible extinction (Yates and Broadhurst 2002).

Officers of the Department's Threatened Flora Seed Centre observed low fruit production and predation of fruits during 1996, but in 1997 fruit production was greater and predation lower than the previous year. These variations are not uncommon in wild populations of native plants although the reasons for this are not clear.
A three year study assessing limitations on population growth of *Acacia aprica* was initiated in 1999 and the results published (Yates and Broadhurst 2002). This study examined:

- Size class structure and health of individual plants.
- Reproductive characteristics and potential over three consecutive flowering seasons from 1999 to 2001.
- Impact of invasive weeds and grazing on seedling establishment from seed sown in 2000 on trial plots adjacent to two existing populations.

Seedling emergence and subsequent performance were monitored in 2000 to 2001. Key findings from this study were that the availability of viable seeds is not a limiting factor for *Acacia aprica*, rather:

- Factors associated with seed germination and seedling establishment (the regeneration niche) appear to be a more likely explanation for population decline. This was highlighted by the fact that of all the treatments regimes imposed on the transplanted seedlings in the study, removal of annual weeds resulted in the greatest increase in survival and growth.
- Maintenance of stable populations of *Acacia aprica* will require in–situ management of the 'regeneration niche' through judicious use of fire to stimulate germination in conjunction with effective weed control.

Threats

This species is ranked as Critically Endangered under (IUCN 2000) Red List criteria B1ab(iii,v)+2ab(iii,v) due to the low number of extant plants (263), the extreme fragmentation of the populations, and decline in the quality of the habitat. The main threats are weed invasion, road and firebreak maintenance activities, chemical drift, grazing, and inappropriate fire regimes.

- **Weed invasion,** predominately by annual grasses, is a serious threat to all populations. The immediate habitat of Population 9 (low scrub over heath) is comparatively less impacted, however to the west of the population the remnant York Gum woodland is heavily weed infested. Weed incursion is increased by runoff from surrounding cleared areas and roads, influx of weed seeds from surrounding paddocks, and habitat disturbance due to road maintenance activities. Weeds compete with adult plants, suppress recruitment and exacerbate the threat of increased fire frequency by increasing the fuel load. Weed invasion has been identified as one of the greatest impediments to the likelihood of success of recruitment and establishment of new plants after disturbance such as fire (Yates and Broadhurst 2002).

- **Inappropriate fire regimes** would adversely affect the viability of populations, as seeds of *Acacia aprica* probably germinate following fire. The soil seed bank would therefore be rapidly depleted if fires recurred before regenerating or juvenile plants reached reproductive maturity to replenish the soil seed bank. However, it is likely that occasional fires are required for reproduction of this species. Weed invasion following fire events is also a significant threat to regeneration potential.

- **Road, rail and firebreak maintenance activities** threaten plants and habitat for all road verge and rail reserve populations of *Acacia aprica*. These include actions such as road verge grading, constructing drainage channels and mowing the roadside vegetation to improve visibility. These disturbance events also often encourage weed invasion. Young plants can be seen on old grader scrapes and these may be vulnerable to destruction from future maintenance activities. These disturbance events also usually encourage weed invasion into the habitat.

  Although the single plant originally identified at Population 6 on private land has not been relocated, repeated disturbance may affect any recruitment of new individuals from the potential seedbank. This also applies to Population 9 which is located within a privately owned remnant.

- **Chemical drift** from herbicide and fertiliser applications from nearby farmland may affect the species' growth and survival.

- **Grazing** by rabbits, kangaroos or stock has the potential to impact on *Acacia aprica* populations. In addition to grazing, rabbits may also have an impact by encouraging invasion of weeds through soil digging, addition of nutrients to soil, and introduction of weed seeds. Palatable weeds near populations can attract herbivorous animals, which are often unselective in their grazing.

Summary of population information and threats

Pop. No. & Location	Land Status	Date / No. of Plants	Condition	Threats
1. SE of Carnamah	*MRWA Road Reserve	7.96 102 4.98 107 7.98 139	Moderate	Road maintenance activities, fire, weeds
2. SE of Carnamah	MRWA Road Reserve	7.96 2 4.98 2 5.99 2 7.00 2	Poor	Road maintenance activities, fire, weeds
3. SE of Carnamah	Shire Road Reserve	7.96 5 4.98 7 7.98 8 4.99 13 7.00 13 1.03 10	Very poor	Road maintenance activities, fire, weeds
4. SE of Carnamah	Shire Road Reserve	7.96 1 4.98 1 7.98 1 5.99 2 7.02 1	Poor	Road maintenance activities, fire, weeds
4. b SE of Carnamah	Shire Road Reserve	1.03 2	Poor	Road maintenance activities, fire, weeds
5. SE of Carnamah	Shire Road Reserve	7.96 2 4.98 3 7.98 3 5.99 3 7.00 3 1.03 3	Very poor	Road maintenance activities, fire, weeds
6. SE of Carnamah	Private property	7.98 1 1.03 0	No living specimens	Firebreak and fence maintenance, fire, weeds
7. SE of Carnamah	Private property	11.99 100	Healthy	Firebreak and fence maintenance, fire, weeds
8. (8T) SE of Carnamah	Shire Reserve	Year Translocated** 1998: Date No. 99 76; 00; 01 52; 02 1999: Date No. 99 181; 00 164; 01 159; 02 159 2000: Date No. - -; 00 361; 01 180; 02 177	Translocation	Firebreak and fence maintenance, fire, weeds
9. SE of Carnamah	Shire Road Reserve	7.02 7 1.03 6	Moderate?	Road maintenance activities, fire, weeds

*MRWA = Main Roads Western Australia

**For Population 8T, numbers refer to plants surviving in each succeeding year from each particular translocation year.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Any on-ground works (clearing, firebreaks, roadworks etc) in the immediate vicinity of *Acacia aprica* will require assessment. On-ground works should not be approved unless the proponent can demonstrate that they will not have an impact on the species, or on its habitat or potential habitat.

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.

Criteria for success: The number of individuals within populations and/or the number of populations have increased by ten percent or more.
Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by ten percent or more.

3. RECOVERY ACTIONS

Existing recovery actions

All appropriate agencies and land managers have been made aware of the existence of *Acacia aprica* and its locations on land under their jurisdiction.

Declared Rare Flora (DRF) markers have been installed at all road and rail reserve populations.

The Shire of Coorow and Main Roads Western Australia (MRWA) were formally notified of the presence of populations of *A. aprica* on lands they managed in January 1998. These notifications detailed the Declared Rare status of the species and associated legal obligations. The Shire of Coorow was provided with a map and verbal description of the location of markers installed on their road reserves and MRWA personnel were present at the installation of markers at Populations 1 and 2. The owner of land on which Population 6 occurs received notification in February 1999 and agreed to take care near the single plant of *Acacia aprica* when maintaining the nearby firebreak on this property.

Declared Rare Flora (DRF) markers were installed at Populations 3 and 5 in July 1998, and at Populations 1 and 2 in December 1998. DRF markers alert people working in the area to the presence of significant flora. This helps to prevent accidental damage during maintenance operations. Markers at Population 3 were repositioned in August 2000 to include additional plants located through subsequent surveys. A new population (number 9) of seven individuals was identified in August 2002 by officers of the Department and several plants close to the road noted as being vulnerable to damage from road works. DRF markers were installed and the Coorow Shire Council notified. In February 2003 DRF markers for Population 4 were installed to include the two plants comprising Population 4b. The single very old plant at Population 4 is located against a fence, and is far enough from the road edge to be protected from roadside grading.

Owners of the vegetation remnant that contains Population 7 were notified of the presence of *Acacia aprica* in February 2000 and the particular significance of this site for conservation of the species highlighted. An agreement has been reached between the owner and the Department to re-fence the area. Materials have been made available to assist the landowner to carry out the required works. The owners have expressed an interest in this species, and permitted future access for monitoring and research.

Awareness of the significance of DRF markers is being promoted to relevant authorities such as Shires, Main Roads WA, Westnet Rail and Fire and Emergency Services Authority. Dashboard stickers, information sheets and drink holders have also been produced and distributed. These illustrate DRF markers, inform of their purpose and provide a contact telephone number to use if such a marker is encountered.

In 1998 a translocation programme was commenced to address the significant immediate threats posed to the species from the low number of plants and high degree of habitat fragmentation. Initial trials were carried out by direct seeding in August 1998 and were conducted on an experimental basis, with the aim of providing information about effective techniques for future translocations. Seed was collected from one population and several plants cultivated by the Botanic Gardens and Parks Authority (BGPA). No seedlings were found when the direct seeding trial was examined in December 1998. However it was subsequently noted that 76 seeds had germinated of which 52 were still surviving as seedlings in 2001. Two further experimental translocations took place in 1999 and 2000 with seedling stock raised by BGPA from germinants supplied by the Department's Threatened Flora Seed Centre (TFSC). These translocations were subject to several experimental treatments assessing the effectiveness of establishment methods. The surviving plants have been monitored annually.

In 1999 a three year study assessing limitations on population growth of two rare acacias including *Acacia aprica* was undertaken (Yates and Broadhurst 2002). As part of this study, in 2000 seed was sown on trial plots adjacent to two natural populations to assess the impact of invasive weeds and grazing on seedling establishment. The emergent seedlings were monitored from 1999 to 2001. Surviving plants from the translocation trials and ecological study plots continue to be assessed as part of the regular programme of monitoring for all the natural populations.

897 seeds were collected from 30 plants during November 1996 and approximately 20,000 from 60 plants in Population 1 in 1997. These collections were stored at -18°C in the Department's TFSC. The TFSC test the viability of the seed initially, after one year in storage, and again within 5 - 6 years. Germination rates ranged from 43% to 85%, with the higher rates reflecting additional seedcoat treatments applied prior to the first year storage test. Currently no living plants are held by Botanic Gardens and Parks Authority (BGPA), however a subset of seedlots collected by the TFSC is maintained at the BGPA.

Three phases of translocation trials have been carried out. Survival and mean height data have been collected to assess the following methods:

1. 1998, direct seeding, with watering and mulching
2. 1999, planting of seedlings, with mulching.

3. 2000, planting of seedlings, with grazing exclusion fencing.

In addition comparative data have been collected to assess phenology, flowering intensity, fruit and seed production for natural and translocated populations of *Acacia aprica.* Currently there are 388 surviving plants in translocated populations.

Staff from the Department's Moora District regularly monitor populations.

A poster illustrating all critically endangered flora taxa in Moora District has been prepared for display at Shire offices and shopping centres. An information sheet for *Acacia aprica* has also been produced with photographs, a description of the plant, its habitat type, threats and management actions.

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 the Department's Corporate Executive and funding bodies.

Future recovery actions

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

1. Coordinate recovery actions

The Moora District Threatened Flora Recovery Team (MDTFRT) will coordinate recovery actions for *Acacia aprica* and other Declared Rare Flora in the region. They will include information on progress in their annual report to the Department's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: The Department (Moora District) through the MDTFRT
Cost: $1000 per year

2. Map Critical habitat

It is a requirement of the EPBC Act that spatial data relating to critical habitat be determined. Although critical habitat is described in Section 1, the areas as described have not yet been mapped and that will be done under this action. If any additional populations are located, then critical habitat will also be determined and mapped for these locations.

Action: Map critical habitat
Responsibility: The Department (Moora District, WATSCU) through the MDTFRT
Cost: $2000 in the first year

3. Implement weed control

With the exception of Population 7 all populations are severely weed infested. Adult *Acacia aprica* plants are currently surviving competition from weeds, however the effect on subsequent recruitment presents a greater potential threat. Weed control with the use of herbicides will be undertaken for all populations. The tolerance of native plant species to herbicides at *Acacia aprica* sites is unknown, so the impact of herbicides will be monitored. A weed control program for these populations is required and will involve:

1. Accurately mapping the boundaries of the weed populations.
2. Selection of an appropriate herbicide or alternative method of weed control after determining which weeds are present.
3. Controlling invasive weeds internal to the boundary of the *Acacia aprica* population by hand removal and spot spraying around individual *Acacia aprica* plants when weeds first emerge.
4. Scheduling to include weed spraying of other Declared Rare Flora populations requiring weed control within Moora District.
5. Any incidental disturbance activities within or around *Acacia aprica* populations, particularly where there is the potential for stimulating germination, will be monitored for weed incursions and appropriate control measures taken to enhance natural recruitment of *Acacia aprica*.
6. Any approved programme of controlled experimental or ameliorative disturbance such as fire in or around populations of *Acacia aprica* will include a post disturbance weed management strategy.

Action: Implement weed control
Responsibility: The Department (Moora District) through the MDTFRT, relevant land managers
Cost: $1000 per year.

4. Continue to implement approved Translocation Proposal

Subsequent to the initial translocation of *Acacia aprica* by direct seeding, approval was given for the planting of seedling stock. New translocation sites will be sought to increase the number of established populations, and to continue to refine establishment methods. In addition, if possible, further seed will be collected and used in translocations to ensure that material used is from a wider range of populations.

Translocations will continue to be monitored until it can be determined that the translocations represent viable self-sustaining populations.

Action: Continue to implement approved Translocation Proposal
Responsibility: The Department (Science Division, Moora District) through the MDTFRT
Cost: $5000 per year for Year 1, 2 and 3

5. Attempt to stimulate germination

Attempts will be made to stimulate germination of soil-stored seed in areas adjacent to extant *A. aprica* ms populations. This will involve experimental treatments that may include burning, smoke treatment and/or ground raking. It is hoped that this will result in improved habitat through encouraging regeneration of associated native species as well as *Acacia aprica*. Weed control will be undertaken as part of this recovery action, as any disturbance will also stimulate weed germination. The results of all trials will be monitored regularly.

Action: Attempt to stimulate germination
Responsibility: The Department (Science Division, Moora District) through the MDTFRT
Cost: $3,000 for the first year, $2,000 per year for the second and third years, $500 for the fourth and fifth years

6. Monitor populations

Monitoring factors such as weed densities, habitat degradation, population stability (expansion or decline), pollination activity, seed production, recruitment and longevity is essential. For Populations 1, 2, 3, 4, 4a, 5, and 9 DRF markers will also be monitored annually for visual prominence eg: where subject to weathering, or obscuring vegetation, such that they remain visible and effective.

Action: Monitor populations
Responsibility: The Department (Moora District) through the MDTFRT
Cost: $1,600 per year.

7. Implement fire management strategy

Little is known about the effects of fire on this species. It is likely that the species requires occasional fire for recruitment from soil-stored seed, but frequent fires may be detrimental to the long-term survival of the species. Fire also promotes the introduction and proliferation of weed species.

A fire management strategy has been developed in consultation with relevant land managers. The strategy takes into account current information about factors including soil seed banks and modes of reproduction, and recommends exclusion of fire except when required to stimulate regeneration, and also specifies fire control methods. This plan will be implemented, and amended as required as additional information becomes available.

Action: Implement fire management strategy
Responsibility: The Department (Moora District) through the MDTFRT, relevant land managers
Cost: $1,000 per year.

8. Obtain biological and ecological information

Increased knowledge of the biology and ecology of the species will provide a scientific basis for management of *Acacia aprica* in the wild. Initial work by Yates and Broadhurst (2002) has greatly improved knowledge of the species. Future investigations will include:

1. Further study of the soil seed bank dynamics, including seedbank location and viability.

2. The role of various factors such as, competition, rainfall, grazing, disturbance, seedling recruitment and survival, particularly in relation to the enhancement and maintenance of the species regeneration niche.
3. Determination of reproductive strategies, phenology and seasonal growth.
4. Investigation of the mating system and pollination biology.
5. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.
6. Investigation of the impacts of herbicide on habitat

Action: Obtain biological and ecological information
Responsibility: The Department (Science Division, Moora District) through the MDTFRT
Cost: $17,000 in the second year.

9. Collect seed and cutting material

It is necessary to store germplasm as a genetic resource, ready for use in translocations and as an *ex situ* genetic 'blueprint' of the species. The germplasm stored will include seed and live plants in cultivation. A quantity of seed has been collected from Population 1. However, some of this has been used for translocations and ecological research trials. Further collection is necessary to maintain adequate representation of the remaining genetic diversity of this taxon.

Action: Collect seed and cutting material
Responsibility: The Department (TFSC, Moora District), BGPA, through the MDTFRT
Cost: $2,000 in the second and fourth years.

10. Conduct further surveys

Further survey for the species will be undertaken during the species' flowering period (June-August) on a systematic basis in areas of suitable habitat. Volunteers from the local community, Wildflower Societies, Naturalist Clubs, other community-based groups and tertiary students will be encouraged to be involved in surveys supervised by Departmental staff.

Suggested survey locations include the Pinjarrega Nature Reserve, where the similar taxon, *A. filifolia,* occurs.

Action: Conduct further surveys
Responsibility: The Department (Moora District) through the MDTFRT
Cost: $2,300 per year.

11. Promote awareness

The importance of biodiversity conservation, the preservation of critically endangered species generally and *Acacia aprica* in particular will be promoted to the public. Awareness will be encouraged in the community through a publicity campaign using the local print and electronic media and poster displays. Formal links with local naturalist groups and interested individuals will also be encouraged. An information sheet that includes a description of the plant, its habitat, threats, management actions, and photos has been produced. This will continue to be distributed to the public through the Department's Moora District office and at the offices and libraries of the Shires of Coorow and Carnamah. Such activities may lead to the discovery of new populations.

Action: Promote awareness
Responsibility: The Department (Moora District, Corporate Relations Division) through the MDTFRT
Cost: $500 per year.

12. Review the need for a full Recovery Plan

This Interim Recovery Plan will operate from June 2003 to May 2008, when it will be reviewed, but will remain in force until withdrawn or replaced. If the species is ranked as Critically Endangered at that time a full Recovery Plan may be required.

Action: Review the need for a full Recovery Plan
Responsibility: The Department (Moora District) through the MDTFRT
Cost: $10,000 in the fifth year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from June 2003 to May 2008 but will remain in force until withdrawn or replaced. If the taxon is ranked Critically Endangered after five years, the need to review this IRP or to replace it with a full Recovery Plan will be determined.

5. ACKNOWLEDGMENTS

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

Mr Andrew Crawford	Technical Officer, the Department's Threatened Flora Seed Centre
Ms Amanda Shade	Propagator, Kings Park and Botanic Garden
Dr Colin Yates	Senior Research Scientist, the Department's Science Division
Ms Leonie Monks	Research Scientist, the Department's Science Division
Ms Gillian Stack	Project Officer, the Department's WA Threatened Species and Communities Unit
Ms Val English	Ecologist, the Department's WA Threatened Species and Communities Unit
Ms Gina Broun	Conservation Officer, the Department's Moora District

Thanks also to Science Division staff for providing access to Herbarium databases and specimen information, and the staff of the Department's Wildlife Branch for assistance.

13. REFERENCES

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

Cavanagh, T. (1987). Germination of Hard-seeded Species (Order Fabales). Pp. 58-70 in P.L. Langkamp (ed.). *Germination of Australian Native Plant Seed*. Inkata Press, Melbourne.

Department of Conservation and Land Management (1992). Policy Statement No. 44 Wildlife *Management Programs*. Perth, Western Australia.

Department of Conservation and Land Management (1994). Policy Statement No. 50 Setting *Priorities for the Conservation of Western Australia's Threatened Flora and Fauna*. Perth, Western Australia.

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

IUCN (2000). *IUCN Red List Categories prepared by the IUCN Species Survival Commission, as approved by the 51st meeting of the IUCN Council*. Gland, Switzerland.

Maslin, B.R. and Chapman, A.R. (1999) Acacia miscellany 19. The taxonomy of some Western Australian species of Acacia Section Juliflorae with 4-merous flowers (Leguminosae: Mimosoideae). *Nuytsia* Vol.12, No 3. pp 469-486.

Stack, G. and English, V. (1999). Interim Recovery Plan number 22 *Acacia aprica* 1999-2002. Department of Conservation and Land Management. Perth, Western Australia.

Yates, C.J. and Broadhurst, L.M. (2002) Assessing limitations on population growth in two critically endangered Acacia taxa. *Biological Conservation* Vol 108 pp13 – 26.

14. TAXONOMIC DESCRIPTION

Maslin, B.R. and Chapman, A.R. (1999) Nuytsia Vol.12, No 3

Acacia aprica Maslin & A.R. Chapman, sp. nov.

Diffuse, open shrub 1.5m tall, dividing near ground level into 2 to many spreading main stems, the upper branches often spreading +/- horizontally, Bark dark grey, smooth except fine fissures towards base of stems. Branchlets slightly flexuose, not or scarcely pendulous, red-brown, densely silvery sericeous between the often–resinous ribs, Stipules not seen. Phyllodes terete to sub-quandrangular, 5-11 cm long, rarely very few to 14cm, 1-1.5mm diam., rather stout and sparse, moderately to strongly incurved or sometimes shallowly serpentinous, silvery sericeous when young (especially between nerves), commonly glabrous at maturity except appressed hairs at base, dull green to grey-green; longitudinal nerves 8, broad (0.2-0.3mm wide), +/-flat–topped, not or scarcely raised and separated by an equal number of shallow and narrow yet distinct, dark longitudinal furrows, the nerves of +/- uniform width and prominence; apex acute with a dark brown point; pulvinus very indistinct. Gland situated on upper surface of phyllode 1-3mm above base, obscure, slightly swollen. Inflorescence simple. single or paired in axil of phyllode. Heads subglobular to obloid, sessile to subsessile (peduncle to 2mm long, densely hairy), 7-10mm long and 7-8mm wide when dry, densely 40-55-flowered, golden; bracteoles persistent, spathulate, c. 1mm long, with a narrow stipe and a rhomboid, acute, dark lamina. Flowers 4–merous; sepals 1/2 to 2/3 length of petals, c. 1/2 united, the lobes narrow, thickened at apex, dark and puberulent along midrib; petals 1.5-2mm long, viscid without an obvious midrib. Ovary sessile, puberulous; style sub-lateral. Pods linear, shallowly to moderately constricted between seeds, flat, 2.5-6cm long, c. 2mm wide, thinly crustaceous, straight to shallowly curved, red-brown. Silvery sericeous on faces: margins broad, glabrous, yellow or red-brown. Seeds longitudinal, obloid-ellipsoid, 2.5-3mm

long, 1.5-2mm wide, 1mm thick, glossy, pale brown mottled yellow (pale yellowish prior to maturity); funicle filiform, expanded into a small, terminal, cream (dry) aril measuring 1/4–1/3 length of seed.

Closely related to *A. filifolia* which has wispy taller habit and longer, generally thinner phyllodes. Also related to *A. arcuatilis* and *A. lirellata*. All three species occur in the Coorow area.