

TRANSLOCATION PROPOSAL

Blunt Wattle, *Acacia aprica* ms (Mimosaceae)

1. SUMMARY

Acacia aprica ms is a spreading, open multi-stemmed shrub to 2 m tall. The branches are slightly flexuose (zig zagging). The phyllodes are terete, sessile with a sharp point at the end. They are a dull medium-green, between 6 and 14 cm long and 1-1.4 mm wide, with 8 closely parallel nerves. The inflorescences are golden, globular to oblong and occur from June to August (Chapman and Maslin, in prep). The seed pods are linear and seed viability ranges from 43 - 84% (A. Cochrane pers. comm).

The first known collection of *A. aprica* ms, was made in 1957 by JW Green "15 miles south of Carnamah". Despite extensive further surveys in this area only five populations of this species have been discovered. At this stage the species has not been formally named, however it has been assigned the manuscript name of *aprica*.

A. aprica ms is endemic to the Coorow area of Western Australia having a range of around 45 km. It is known from five populations, with 120 individuals. It is found in gravelly brown sand or loam within a heath vegetation type. Due to the small population sizes, restricted distribution and threats associated with growing in narrow road verges that are exposed to weed invasion, accidental damage from road maintenance activities and chemical drift from adjacent farms, *A. aprica* ms was declared as Rare Flora in November 1997, and ranked as Critically Endangered at the same time. An Interim Recovery Plan is being written for this species (Stack and Brown in prep).

The aim of this translocation proposal is to conserve the wild genetic stock of the species by establishing another viable population of *A. aprica* ms. This will be achieved by translocating (introducing) this species to a secure reserve. This translocation proposal outlines the need for translocation of the critically endangered *A. aprica* ms, the site selection process, the design of the translocation site and the provisions for monitoring. In addition it outlines the criteria for success or failure of this proposed translocation.

2. PROPONENTS

Dr David Coates
Principal Research Scientist
Dept. Conservation and
Land Management
KENSINGTON WA 6151
(08) 9334 0490

Leonie Monks
Research Scientist
Dept. Conservation and
Land Management
KENSINGTON WA 6151
(08) 9334 0495

TABLE OF CONTENTS

<i>1</i>	
1. SUMMARY	1
<i>2</i>	
2. PROPONENTS	1
<i>3</i>	
3. BACKGROUND	3
3.1 History, Taxonomy and Status	3
3.2 Distribution and Habitat	3
<i>4</i>	
4. THE TRANSLOCATION	3
4.1 The Need to Translocate	3
4.2 Translocation Site Selection	4
4.3 Translocation Design	5
4.4 Source of Plants	5
4.5 Criteria for Success or Failure	6
<i>5</i>	
5. TIMETABLE	6
<i>6</i>	
6. FUNDING	6
<i>7</i>	
7. ACKNOWLEDGMENTS	6
<i>8</i>	
8. REFERENCES	6
<i>A</i>	
Appendix One	8
Appendix Two	9
Appendix Three	11
Appendix Four	13
Appendix Five	14

3. BACKGROUND

3.1 History, Taxonomy and Status

Acacia is a large Australia genus belonging to the family Mimosaceae. Commonly known as wattles, the genus is comprised of some 700 named species.

Acacia aprica ms is a spreading, open multi-stemmed shrub to 2 m tall. The branches are slightly flexuose (zig zagging). The phyllodes are terete or sometimes quadrangular, sessile with a sharp point at the end. They are a dull medium-green, between 6 and 14 cm long and 1-1.4 mm wide, with 8 nerves, which are parallel and more or less equally wide. The inflorescences are golden, globular to oblong, hang 2 per axil and occur from June to August. The seed pods are linear, up to 60 mm long and around 2 mm wide (Chapman and Maslin, in prep). Seed viability ranges from 43 - 84% (A. Cochrane pers. comm).

The first known collection of *A. aprica* ms, was made in 1957 by JW Green “15 miles south of Carnamah”. Despite extensive further surveys in this area by botanist Charles Chapman, *Acacia* expert Bruce Maslin and consultant Diana Papenfus only five populations of this species have been discovered. At this stage the species has not been formally named, however it has been assigned the manuscript name of *aprica*, meaning sun-loving or open to the sun.

Due to the small population sizes, restricted distribution and threats associated with growing in narrow road verges that are exposed to weed invasion, accidental damage from road maintenance activities and chemical drift from adjacent farms, *Acacia aprica* ms was simultaneously declared as Rare Flora, and ranked as Critically Endangered in November 1997. An Interim Recovery Plan is in the process of being written for this species (Stack and Brown, in prep).

3.2 Distribution and Habitat

A. aprica ms is endemic to the Coorow area of Western Australia having a known range of around 45 km. It is known from five populations, with 120 individuals. It is found in gravelly brown sand or loam within a heath vegetation type. Associated species include *Acacia acuminata*, *Allocasuarina campestris*, *Grevillea paniculata*, *Hakea scoparia* and *Melaleuca fulgens*.

4. THE TRANSLOCATION

4.1 The Need to Translocate

A. aprica ms is known from just five populations with only 120 individuals (see table 1). Four of these populations consist of seven plants or fewer. All five of the populations occur within a range of approximately 45 km on narrow road reserves vested with the Shire of Coorow or Main Roads, WA.

Table 1. Population details for *Acacia aprica*.

Population no.	Number of individuals	Land tenure
1	107	MRD road verge
2	2	MRD road verge
3	7	Shire road verge
4	1	Shire road verge
5	3	Shire road verge

Road maintenance activities could have an impact on the populations of *A. aprica* ms. On April 1st 1998 it was noted that activities associated with fenceline maintenance had caused damage to the largest population, narrowly missing at least one plant. Weed invasion is evident in all populations, and chemical drift from fertilisers and pesticides from adjacent farms are considered to be a problem. Translocation of this critically endangered species is considered to be of high priority due to the tenuous nature of these road verges. The draft Interim Recovery Plan for *A. aprica* ms also recommends the translocation of this species to a secure site (Stack and Brown, in prep).

4.2 Translocation Site Selection

A search was made of areas around the known populations at Coorow on 23rd February 1998 to locate a suitable translocation site. An area on the southern boundary of the Reserve (#) was chosen as the translocation site. Permission was sought and granted from the Shire of Carnamah to locate the translocation site on reserve # (see Appendix three). Endorsement was also received from the CALM Midwest Region (Appendix five). Despite the reserve being vested in the Shire of Carnamah as a Recreation Reserve, and not as a Conservation Reserve, this site is considered secure. This is because the shire has no plans to develop the site, and has granted permission for the old tip and gravel pit within the reserve to be rehabilitated as part of this translocation project (see Appendix three).

As this species has not previously been recorded from this reserve this translocation can be considered an introduction under the definitions provided by Policy Statement 29 and the Guidelines for Translocation of Threatened Plants in Australia. A map of the proposed translocation site in relation to the known populations is shown in Appendix one.

The known populations of *A. aprica* ms occur on a soil type of gravelly light brown sand or loam and have an underlying geology of lateritic gravel with sand and minor amounts of clay, laterite or deeply weathered schist (Baxter and Lippel 1985). The proposed translocation site occurs on a soil type of lateritic gravel grading to light brown loam and has an underlying geology of lateritic gravel with sand and minor amounts of clay (Baxter and Lippel 1985) which is identical to the known populations.

The existing populations have a highly modified vegetation structure of Low Scrub A (using Muir's classification). The proposed translocation site is also located within a highly modified environment, but is surrounded by vegetation which fits the criteria of Heath A (using Muir's classification). The proposed translocation site has many associated species in common with the know populations, these are shown below in Table 2. No individuals of *A. aprica* ms were found during surveys of this reserve for translocation sites, despite the similarity of the vegetation. It is considered highly unlikely that *A. aprica* ms will hybridise with any species within the reserve (B. Maslin pers. comm).

Table 2. A comparison of the main associated vegetation at the proposed translocation site within the Carnamah Shire Recreation Reserve with the known populations of *A. aprica* ms.

Main associated species of the original populations of <i>A. aprica</i> ms.	Main associated species of the proposed translocation site within the Carnamah Shire Recreation Reserve
<i>Acacia acuminata</i>	<i>Acacia acuminata</i>
<i>Allocasuarina campestris</i>	<i>Allocasurina campestris</i>
<i>Borya spaerocephala</i>	
<i>Dianella</i> sp.	
<i>Eremophila duttonii</i>	
<i>Eucalyptus loxophleba</i>	
<i>Grevillea paniculata</i>	<i>Grevillea paniculata</i>
<i>Hakea scoperia</i>	<i>Hakea scoperia</i>
<i>Melaleuca fulgens</i>	<i>Melaleuca fulgens</i>
<i>Olearia axillaris</i>	
<i>Scaevola spinescens</i>	
<i>Verticordia</i> sp.	

The proposed translocation site is considered to have almost identical environmental attributes of climate, soil type, vegetation structure and associated vegetation to the known populations of this species. The proposed translocation site is only 12.7 km from the furthestmost and 8.45 km from the nearest occurrences of this species. It is therefore, the closest site on a secure shire reserve, with almost identical attributes, and so is considered to be the best site available for the translocation of such a critically endangered species.

4.3 Translocation Design

A total of five replicates of 16m x 5m each will be measured. Each replicate will be divided into a grid of 15 x 4 rows.

In the absence of any data as to what is the best pretreatment method a fairly standard pretreatment technique will be used. That is, if there are wet soil conditions, seeds will be soaked overnight in just boiled water prior to planting out. If there are dry soil conditions seed will only be soaked in near boiling water for 15 seconds before being dried and then planted. This species is known to have a germination of between 43 - 84% (A. Cochrane pers. comm), so each hole in the grid will be planted with five seeds to increase the chances of each hole eventually containing a germinant.

A total of four treatments will be tested: control, watering, mulching or watering and mulching (see Table 3). Treatments will be randomly assigned to a row in the grid (see Appendix one for site diagram).

An irrigation system will be set up in November 1998 to water once a week those plants assigned to the watering or watering and mulching categories. A soil wetting agent will be added to the soil around all plants in November 1998.

Each plant will be permanently tagged so that each individual will always be identifiable. A cage of rabbit netting will be placed around each plot to prevent the consumption of the seedlings by large herbivores.

All equipment used during translocation planting will be maintained under strict disease hygiene.

Table 3. Description of experimental treatments.

Treatment	Description of Treatment
Control	Plants not given any treatment.
Mulched	A layer of mulch is placed around the plant to see whether it enhances survival by increasing water retention.
Watered	Plants will be watered with a set amount of water once a week for 24 weeks from the start of November to the end of April to see whether watering over the first summer enhances survival
Watered and mulched	A layer of mulch is placed around the plant and in addition plants will be watered with a set amount of water once a week for 24 weeks from the start of November to the end of April to see whether it is a combination of both watering and mulching that enhances survival.

Monitoring of the translocated population will be undertaken every second month commencing one month after the planting out of the seeds. Monitoring will include counting the number of surviving germinants, height of the surviving germinants, width of the crown of the surviving germinants in two directions (so that crown volume can be calculated), reproductive state, number of inflorescences and pods, whether second generation plants are present and general health of the plants. A set photo point will be allocated for each plot and a photo will be taken each time monitoring takes place.

Monitoring of the original populations will also occur every second month in conjunction with monitoring of the translocated population. This will provide essential baseline data for assessing the performance of the translocated population. Monitoring will include counting the number of individuals, height and crown width of the individuals, reproductive state, number of inflorescences and pods and general health of the plants.

4.4 Source of Plants

Seed was collected under guidelines outlined in Appendix four. Seed has been sourced from population one from a bulked collection from 60 plants for planting at the translocation site in 1998. Population 1 was by far the largest population and therefore considered to have the greatest genetic variability. In addition, seed was only available from population 1.

4.5 Criteria for Success or Failure

Criteria for Success

- Short Term: germination and establishment of translocated seed production of flowers and seed after one generation the number of individuals is sustained by natural recruitment
- Long Term: after two or more generations the number of individuals is sustained by natural recruitment, and a soil stored seed bank has been established.
- The production of guidelines for the establishment of future translocations of related species.

Criteria for Failure

- Short Term: failure of translocated seed to germinate and establish failure of plants to produce flowers and seed
- Long Term: there is a significant decline in the size of the translocated population due to lack of natural recruitment

5. TIMETABLE

Time	Action
November 1997	Seed collection
February 1998	Translocation site selected.
April 1998	Translocation proposal submitted for review.
June - July 1998	Translocation of seeds into the Carnamah Shire Recreation Nature reserve.
July - August 1998	Follow up monitoring and maintenance of translocation site.
August 1998 - May 1999	Monitoring and maintenance of translocation site.
October 1998	Translocation proposal for 1999 translocation submitted for review.
November 1998	Seed collection
November 1998	Setting up of irrigation system.
November 1998	A batch of seeds put down for germination. Resulting seedlings raised at Kings Park and Botanic Gardens.
April 1999	Progress report.
May - June 1999	Translocation of seedlings into the Carnamah Shire Recreation Reserve.
June - July 1999	Follow up monitoring and maintenance of translocation site.
August 1999 - May 2001	Monitoring and maintenance of translocation site.
May 2001	Final Report

6. FUNDING

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7. ACKNOWLEDGMENTS

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8. REFERENCES

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Appendices One, Three, Four and Five may be available on contacting authors.

Appendix Two.

Site Diagram for Proposed Translocation of *Acacia aprica* ms.

1500 seeds will be planted with 5 seed planted per hole to ensure at least one seedling per hole will eventuate. These will be planted as shown in the diagram below, with five seeds planted at each point marked with an asterisk (*).

The four treatments of control, watered and mulched, watered and mulched will be assigned as per the diagram below.

Replicate 1

Watered	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Control	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered and Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Replicate 2

Control	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered and Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Replicate 3

Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered and Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Control	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Replicate 4

Control	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered and Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Replicate 5

Watered and Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mulched	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Control	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Watered	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Scale:  1 m

