INTERIM RECOVERY PLAN NO 157

LARGE-FRUITED TAMMIN WATTLE (*ACACIA ATAXIPHYLLA* SUBSP. *MAGNA*)

INTERIM RECOVERY PLAN

2003-2008

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Photo: Anne Harris

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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This Interim Recovery Plan will operate from November 2003 to October 2008 but will remain in force until withdrawn or replaced.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 given regional approval on 3 February 2004 and was approved by the Director of Nature Conservation on 22 July 2004. The allocation of staff time and 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 in November 2003.

ACKNOWLEDGMENTS

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

Andrew Crawford	Manager, the Department's Threatened Flora Seed Centre
Amanda Godfrey	Land Conservation Coordinator, Cunderdin/Tammin LCDC
Amanda Shade	Horticulturist, Botanic Garden and Parks Authority
Kate Brunt	Conservation Officer, The Department’s Merredin District

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

SUMMARY

Scientific Name:	*Acacia ataxiphylla* subsp. *magna*	**Common Name:**	Large-fruited Tammin Wattle
Family:	*Mimosaceae*	**Flowering Period:**	June to September
Dept Region:	Wheatbelt	**Dept District:**	Merredin
Shires:	Cunderdin and Tammin	**Recovery Team:**	Merredin District Threatened Flora Recovery Team (MDTFRT)

Illustrations and/or further information: B.R. Maslin, (1995) *Nuytsia* Vol. 12 (3), pp 323-325; A. Brown, C. Thomson-Dans and N. Marchant (Eds) (1998) *Western Australia's Threatened Flora*; *Flora of Australia* Volume 11A, *Mimosaceae Acacia part 1*. Melbourne: ABRS/CSIRO Publishing (2001).

History and current status: *Acacia ataxiphylla* subsp. *magna* was first collected in 1889. Surveys since that time have located 14 populations and a total of 204 plants on road verges and private property over a range of 15 km south of Tammin and Cunderdin. However, as all are small and highly threatened, the subspecies was declared as Rare Flora and ranked as Critically Endangered in July 1998. It currently meets World Conservation Union Red List Category 'EN' under criteria B1ab(iii,iv,v)+B2ab(iii,iv,v); C2a(i); D (IUCN, 2000) due to its small geographic range, the severe fragmentation of populations and continuing decline in the area, extent and quality of habitat, the number of populations and the number of mature individuals; its population size estimated to be fewer than 2500 mature individuals, a continuing decline in the number of mature individuals and no subpopulation estimated to contain more than 250 mature individuals; and total population size less than 250 mature individuals. *Acacia ataxiphylla* subsp. *magna* is also listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The main threats are road maintenance, weed invasion, restricted habitat, poor recruitment, inappropriate fire regimes and grazing.

A draft Interim Recovery Plan (IRP) was prepared for the species in 1998 (Evans and Brown 1998). Additional information collected since then has been incorporated into this plan.

Description: *Acacia ataxiphylla* subsp. *magna* is a ground-hugging, sprawling, leafless shrub, up to 30 cm high and 50 cm across with weak, ascending to erect stems. Branches are flattened or angled at their extremities. Phyllodes (flattened leaf stalks that resemble the stems), mostly 4 to 6 cm long by 1.6 to 2 mm wide, are somewhat coarse. The yellow flowers borne from June to September are in heads 7 to 9 mm in diameter and are held on stalks 4 to 7 mm long.

Habitat requirements: *Acacia ataxiphylla* subsp. *magna* grows in predominantly shallow grey-brown gravelly sands over laterite in heath, shrub mallee and low woodland. Associated species include *Allocasuarina campestris*, *Xanthorrhoea preissii, Eucalyptus macrocarpa* and several species of *Dryandra, Hakea* and *Acacia* within the habitat. Two other species of Declared Rare Flora - *Hakea aculeata* and *Acacia subflexuosa* subsp. *capillata*, ranked as Endangered and Critically Endangered respectively, are found in the area of some populations of *A. ataxiphylla* subsp. *magna*.

Critical habitat: The critical habitat for *Acacia ataxiphylla* subsp. *magna* comprises the area of occupancy of 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 and may be suitable for translocations.

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

Benefits to other species or ecological communities: *Acacia ataxiphylla* subsp. *magna* occurs with *Acacia subflexuosa* subsp. *capillata* (ranked as Critically Endangered in Western Australia and Endangered by the Commonwealth) at one site and *Hakea aculeata* (ranked as Endangered in Western Australia and Vulnerable by the Commonwealth) at another site. Recovery actions implemented to improve the quality or security of the habitat of *Acacia ataxiphylla* subsp. *magna* will also improve the status of both *Acacia subflexuosa* subsp. *capillata* and *Hakea aculeata*.

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. The taxon is not listed under any specific international treaty, however, and therefore this IRP does not affect Australia's obligations under any other international agreements.

Role and interests of indigenous people: There are no listed indigenous sites in the vicinity of the taxon. Input and involvement will be sought from any indigenous groups that have an active interest in areas that are habitat for *Acacia ataxiphylla* subsp. *magna*, and this is discussed in the recovery actions.

Social and economic impact: Several populations of *Acacia ataxiphylla* subsp. *magna* occur on private land and there is some potential for limited social and economic impact. However, recovery actions will involve liaison and cooperation with all stakeholders.

Evaluation of the Plan's Performance: The Department of Conservation and Land Management (CALM), in conjunction with the Merredin District Threatened Flora Recovery Team (MDTFRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

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

1. Relevant land managers have been made aware of the location and threatened status of the subspecies.
2. Surveys have been conducted to locate new populations.
3. Markers that define populations have been installed and maintained.
4. Approximately 3,017 seeds collected from four populations in November 1998 and November 2001 are stored in CALM'S Threatened Flora Seed Centre at –18°C.
5. The Botanic Garden and Parks Authority currently have one plant of *Acacia ataxiphylla* subsp. *magna* in their nursery.
6. Information on the taxon was forwarded to threatened flora volunteers in the Shire of Quairading through CALM's Narrogin District Office.
7. Discussions have been held with staff from the Shire of Cunderdin regarding the possible installation of bollards to protect plants in Subpopulation 2a from vehicle damage.
8. Fencing is currently being erected around Subpopulation 2b.
9. Information on the use of covenants for populations on private property has been disseminated.
10. Mills Road has been nominated as a 'Flora Road' by the Shire of Cunderdin. One Declared Rare Flora species and one Priority species occur on the road reserve as well as the *Acacia ataxiphylla* subsp. *magna.*
11. Staff from CALM's Merredin District regularly monitor populations of the species.
12. The MDTFRT is overseeing the implementation of this IRP and includes information on progress in annual reports to CALM's Corporate Executive and funding bodies.

IRP Objective: The objective of this Interim Recovery Plan is to abate identified threats and maintain or enhance *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery criteria

Criteria for success: The numbers of individuals within populations and/or the number of populations have increased by ten percent or more over the period of the plan's adoption under the EPBC Act.

Criteria for failure: The numbers of individuals within populations and/or the number of populations have decreased by ten percent or more over the period of the plan's adoption under the EPBC Act.

Recovery actions

1. Coordinate recovery actions
2. Map critical habitat
3. Notify land owners of new populations
4. Liaise with relevant land managers
5. Maintain fences around Populations 5 and 7
6. Install bollards to protect Subpopulation 2a
7. Collect seed and cutting material
8. Develop and implement a rabbit control strategy
9. Develop and implement a weed control strategy
10. Develop and implement a fire management strategy
11. Investigate purchase of land to extend habitat
12. Obtain biological and ecological information
13. Promote community awareness
14. Monitor populations
15. Conduct further surveys
16. Review the need for a full Recovery Plan

1. BACKGROUND

History

Acacia ataxiphylla subsp. *magna* was collected by Alice Eaton in 1889 and formally described by Bruce Maslin in *Nuytsia* Vol. 12, No 3 (1999). The species was declared as Rare Flora in July 1998. It is currently ranked as Endangered.

Surveys between 1997 and 2003 located 13 populations and 3 subpopulations, eight of which are on private property. Two subpopulations on a Conservation Reserve have not been found for six years and are presumed extinct. The largest population contains 56 plants, however, nine of the remaining 13 populations contain less than 10 plants in mostly disturbed, degraded habitats. A total of 204 mature plants are currently known.

CALM has provided relevant land managers with information on the locations of populations and in the case of road reserve populations DRF markers have been installed where required. Roadworks, grazing, and inappropriate fire regimes impact on populations of *Acacia ataxiphylla* subsp. *magna* and its habitat.

A draft Interim Recovery Plan (IRP) was written for the species in 1998 (Evans and Brown 1998). Information collected since then has been incorporated into this Plan.

Description

The specific epithet *magna* refers to the characteristically large flower heads (Maslin 1999).

Acacia ataxiphylla subsp. *magna* is a sprawling, leafless shrub to 30 cm high and 50 cm across with weak, ascending to erect stems. Branches are flattened or angled at their extremities. Phyllodes (flattened leaf stalks that resemble the stems) are mostly 4 to 6 cm long by 1.6 to 2 mm wide and are somewhat coarse. The yellow flowers borne from June to September are in heads, 7 to 9 mm in diameter and are held on stalks 4 to 7 mm long.

Distribution and habitat

Acacia ataxiphylla subsp. *magna* is endemic to the Cunderdin-Tammin area of Western Australia where it occurs over a range of approximately 15 km. Fourteen populations and three subpopulations are known. The habitat of *A. ataxiphylla* subsp. *magna* comprises heath to shrub mallee or low woodland on predominantly shallow grey-brown gravelly sands over laterite. Associated species include *Allocasuarina campestris, Xanthorrhoea preissii, Eucalyptus macrocarpa Dryandra, Hakea and Acacia* Two species of Declared Rare Flora - *Hakea aculeata* and *Acacia subflexuosa* subsp. *capillata*, ranked Endangered and Critically Endangered respectively, are found in the same habitat as several populations of *A. ataxiphylla* subsp. *magna*.

Biology and ecology

Acacia is the largest genus in Australia, comprised of some 700 named species and many more un-named. Commonly known as wattles, *Acacia* species are found in all states of Australia and tolerate a broad range of environmental conditions (Elliot and Jones, 1982). Because of their adaptability, many are important horticultural and commercial plants.

Acacia ataxiphylla subsp. *magna* appears to be a geographically restricted disturbance opportunist with very specific habitat preferences. The subspecies was not found at previous recorded sites within Charles Gardner Nature Reserve and it is likely that this may relate to a lack of disturbance, which contrasts sharply with the level of disturbance seen at most of the more recently discovered population sites (M. J. Fitzgerald 1998). Ten populations (including the largest) have been subjected to varying levels of disturbance in the past.

Human activities involving clearing or destruction of areas of natural vegetation clearly have the potential to influence acacia distributions (Janzen 1974). Clear examples of direct competition in the absence of human interference are relatively rare – distribution of many species appears to be more directly influenced by edaphic or climatic factors (New 1984). The majority of *Acacia ataxiphylla* subsp. *magna* populations occur on linear road reserves that contain limited potential for habitat expansion and are not buffered from climatic extremes such as drought, increased wind velocity, inundation and frost. Restricted habitat and competition from weeds

have been recorded as important threats to the subspecies. Specific response to these threats is, however, unknown.

Recruitment levels in all *Acacia ataxiphylla* subsp. *magna* populations are extremely low with just five seedlings recorded in the vicinity of 204 mature plants. Threatened Flora Seed Centre (TFSC) staff visited populations to collect seed in 1997, November 1998 and November 2001. No fruit was found on plants visited in 1997 and 222 seeds were collected in 1998 from one population. Heavy predation of fruits was observed in two of the three populations visited in 2001 with low or variable fruit production noted. However, 100% germination was attained from the seed collected**.** These variations are not uncommon in wild populations of native plants although the reasons for this are not clear.

Many Australian species of *Acacia* are highly adapted to survive fires that are a regular occurrence in most Australian habitats. Germination of *Acacia* seed is often stimulated by fire but also depends on factors such as fire intensity and seed depth in the soil. No specific information is available about the response of *Acacia ataxiphylla* subsp. *magna* to fire. It has been suggested by CALM's District Officers that *Acacia ataxiphylla* subsp. *magna* may also reproduce through clonal regeneration. No pollinators have been observed during surveys, however, ants and 'other insects' were noted within the *Acacia ataxiphylla* subsp. *magna* habitat.

One plant that originated from germination trials undertaken by TFSC staff is currently held in the nursery at the Botanic Parks and Garden Authority.

Threats

Acacia ataxiphylla subsp. *magna* was declared as Rare Flora in July 1998. It currently meets World Conservation Union Red List Category 'EN' under criteria B1ab(iii,iv,v)+B2ab(iii,iv,v); C2a(i); D (IUCN, 2000) due to: its small geographic range, the severe fragmentation of populations and continuing decline in the area, extent and quality of habitat, the number of populations and the number of mature individuals; its population size estimated to be fewer than 2500 mature individuals, a continuing decline in the number of mature individuals and no subpopulation estimated to contain more than 250 mature individuals; and total population size less than 250 mature individuals. *Acacia ataxiphylla* subsp. *magna* is also listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The main threats are road maintenance, weed invasion, restricted habitat, poor recruitment, inappropriate fire regimes and grazing.

- **Road maintenance** threatens all road reserve populations. Threats include grading, chemical spraying, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion.

- **Weed invasion** has been recorded as a threat to the majority of the *Acacia ataxiphylla* subsp. *magna* populations, especially those that occur on road reserves. Weeds suppress early plant growth by competing for soil moisture, nutrients and light. They also exacerbate grazing pressure and increase the fire hazard due to the easy ignition of high fuel loads, which are produced annually by many grass weed species.

- **Restricted habitat** threatens populations occurring on narrow road reserves and in highly disturbed remnant bushland on private property. The lack of associated native vegetation makes it more likely that pollinators will be infrequent or absent and that extant plants will be subjected to increased edge affects such as chemical drift and weed invasion. In addition, the lack of available habitat for recruitment and spread is of concern.

- **Poor recruitment** threatens most populations with few seedlings being observed.

- **Inappropriate fire regimes** may affect the viability of populations. As seeds of *Acacia ataxiphylla* subsp. *magna* are thought to germinate following fire, the soil seed bank would be rapidly depleted if fires recurred before regenerating or juvenile plants reached maturity. Conversely, it is likely that occasional fires are needed for reproduction of this species.

- **Grazing** by rabbits, kangaroos and stock has been noted as threatening four *Acacia ataxiphylla* subsp. *magna* populations. Rabbits also impact on populations through soil digging, erosion, the addition of

nutrients to soil and introduction of weed seeds. The high levels of palatable weeds near these populations and in adjacent farming properties attract herbivorous animals that are often not selective between introduced and native species when grazing.

Summary of population information and threats

Pop. No. & Location	Land Status	Month/Year - No. plants		Condition	Threats
1a. S of Tammin	Charles Gardner Reserve	21/6/01	0		Presumed extinct
1b. S of Tammin	Charles Gardner Reserve	21/6/01	0		Presumed extinct
2a. S of Cunderdin	Shire Road Reserve	28/7/1997 8/1/2001 28/2/2003	2 3 1	Healthy	Road maintenance, vehicle traffic, weed invasion, inappropriate fire, poor recruitment
2b. S of Cunderdin	Private property	12/8/1997 8/1/2001 28/2/2003	1 1 1	Poor	Firebreak maintenance, restricted and disturbed habitat, weed invasion, poor recruitment
3. SE of Cunderdin	Shire Road Reserve	28/7/1997 28/2/2003	14 16	Healthy	Road maintenance, weed invasion, inappropriate fire, rabbits, grazing,
4. SSW of Tammin	Shire Road Reserve	15/7/1998	26	Healthy	Road maintenance, weed invasion, chemical spray drift, inappropriate fire, rabbits
5. S of Cunderdin	Private property	15/7/1998 3/10/01	6 2	Healthy	Not fenced from roadside access
6. SW of Tammin	Shire Road Reserve	29/8/2000	1	Poor	Road maintenance, weed invasion, inappropriate fire, grazing, poor recruitment
7a. S of Tammin	Private property	21/6/2001	36 (1) [5]	Healthy	Weed invasion, grazing
7b. S of Tammin	Private property	3/7/2001	7	Moderate	Weed invasion, grazing, poor recruitment
7c. S of Tammin	Private property	3/7/2001	1	Healthy	Weed invasion, poor recruitment
8. S of Tammin	Shire Road Reserve	21/6/2001	56 [2]	Moderate	Road maintenance, weed invasion, chemical drift, inappropriate fire, degraded habitat
9. SW of Tammin	Shire Road Reserve		11 [10]	Poor	Road maintenance, weed invasion, restricted and degraded habitat, inappropriate fire
10. S of Tammin	Private property	9/8/2001	1	Poor	Vehicle traffic, gravel extraction, weed invasion, poor recruitment
11. SE of Cunderdin	Shire Road Reserve	3/7/2001	18 [3]	Moderate	Road maintenance, weed invasion, degraded habitat, inappropriate fire
12. S of Cunderdin	Shire Road Reserve	13/12/2001	10 [6]	Moderate	Road maintenance, restricted and degraded habitat
'New'. SSW of Tammin	Private property	6/6/2003	2	Healthy	Grazing by kangaroos and rabbits
'New'. SSW of Tammin	Private property	13/6/2003	5	Healthy	Grazing by kangaroos and rabbits

( ) = number of seedlings; [ ] = number of dead plants.

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 ataxiphylla* subsp. *magna* will require assessment. On-ground works should not be approved unless the proponents can demonstrate that they will not have an impact on the species, its habitat or potential habitat or on the local surface hydrology such that drainage in the habitat of the species would be altered.

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)).

Acacia ataxiphylla subsp. *magna* is listed as Endangered and as such it is considered that all known habitat for wild and translocated populations is critical habitat. This includes:

- the area of occupancy of known populations;

- areas of similar habitat within 200 metres of known populations, i.e. shallow grey-brown gravelly sands over laterite in heath to shrub mallee or low woodland (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); and
- 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 subspecies is listed as Endangered, it is considered that all known habitat for wild and translocated populations is habitat critical to its survival, and that all wild and translocated populations are important populations.

Benefits to other species or ecological communities

Acacia ataxiphylla subsp. *magna* occurs with *Acacia subflexuosa* subsp. *capillata* (currently listed as Critically Endangered in Western Australia and Endangered by the Commonwealth) at one site and *Hakea aculeata* (currently listed as Endangered in Western Australia and Vulnerable by the Commonwealth) at another site. Recovery actions implemented to improve the quality or security of the habitat of *Acacia ataxiphylla* subsp. *magna* will also improve the status of both *Acacia subflexuosa* subsp. *capillata* and *Hakea aculeata*.

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. *Acacia ataxiphylla* subsp. *magna* is not specifically listed under any other international agreement, so the implementation of other international environmental responsibilities is not affected by this plan.

Role and interests of indigenous people

There are no listed indigenous sites in the vicinity of the taxon. Input and involvement will be sought from any indigenous groups that have an active interest in areas that are habitat for *Acacia ataxiphylla* subsp. *magna*, and this is discussed in the recovery actions.

Social and economic impacts

Several populations of *Acacia ataxiphylla* subsp. *magna* occur on private land and there is some potential for limited social and economic impact. However, recovery actions will involve liaison and cooperation with all stakeholders.

Evaluation of the Plan's Performance

The Department of Conservation and Land Management, in conjunction with the Merredin District Threatened Flora Recovery Team will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objectives

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

Criteria for success: The numbers of individuals within populations and/or the number of populations have increased by ten percent or more over the period of the plan's adoption under the EPBC Act.
Criteria for failure: The numbers of individuals within populations and/or the number of populations have decreased by ten percent or more over the period of the plan's adoption under the EPBC Act.

3. RECOVERY ACTIONS

Existing recovery actions

The Shires of Cunderdin and Tammin, and private property owners have been notified about populations of *Acacia ataxiphylla* subsp. *magna* that occur on lands that they manage. These notifications detail the Declared Rare status of the species and associated legal obligations.

Information on the subspecies was forwarded to threatened flora volunteers in the Shire of Quairading through the Department's Narrogin District Office to facilitate the discovery of new populations.

Surveys undertaken by CALM officers between 1997 and 2003 located 14 populations and three subpopulations. Declared Rare Flora (DRF) markers have been installed at all road reserve populations. The markers alert people working in the vicinity to the presence of DRF and the need to avoid work that may damage vegetation in the area. Awareness of the significance of these markers is being promoted to relevant bodies such as Shires and Main Roads Western Australia (MRWA) using posters, dashboard stickers and can holders. These illustrate DRF markers and inform of their purpose.

Five populations and two subpopulations are within areas of private property. All are fenced except for Population 5, which does not have a roadside boundary fence. Fencing is also currently under construction around Subpopulation 2b.Regular communication between CALM and the land managers is ongoing to make sure that existing fences are maintained to provide a more secure habitat for the species. Information on covenants for private property conservation has been provided to property owners that have populations of *Acacia ataxiphylla* subsp. *magna* on their land. This information includes what assistance is available to cover costs of fencing and other management issues.

The Shire of Cunderdin has nominated Mills Road as a 'Flora Road'. This educates and increases the awareness of visitors in relation to flora conservation.

Approximately 3,017 seeds collected from four populations in November 1998 and November 2001 are stored in the CALM's Threatened Flora Seed Centre (TFSC) at –18°C. TFSC staff test the viability of seed soon after the initial collection, after one year in storage and again after five years. The initial germination rate of *Acacia ataxiphylla* subsp. *magna* seed was 100% (unpublished data A. Crawford[1]). Seedlings from the trials are provided to the Botanic Garden and Parks Authority (BGPA) nursery. Six seedlings were received by BGPA in December 1998, of which just one plant remains alive (unpublished data A Shade[2]).

Staff from the CALM's Merredin District regularly monitor all populations of this species.

The Merredin 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 CALM, permission has been or will be sought from appropriate land managers prior to recovery actions being undertaken. The following recovery actions are roughly in order of descending priority; however this should not constrain addressing any of the priorities if funding is available for 'lower' priorities and other opportunities arise.

[1] Andrew Crawford, Technical Officer, the Department's Threatened Flora Seed Centre
[2] Amanda Shade, Horticulturist, Botanic Garden and Parks Authority

1. Coordinate recovery actions

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

Action: Coordinate recovery actions
Responsibility: MDTFRT
Cost: $1,000 per year.

2. Map critical habitat

It is a requirement of the EPBC Act that spatial data relating to critical habitat be determined. Critical habitat is described in Section 1. However, total habitat for the subspecies has not yet been mapped in detail and will be done under this action. If additional populations are located during surveys, critical habitat will be determined and mapped for them also.

Action: Map critical habitat
Responsibility: CALM (Merredin District, WATSCU) through the MDTFRT
Cost: $2000 in the first year.

3. Notify land owners of the new populations

Several recently discovered (June 2003) populations are located on private property. Merredin District Officers will deliver the notification advice to relevant land owners.

Action: Notify land owners of the new populations
Responsibility: CALM (Merredin District, WATSCU) through the MDTFRT
Cost: $400 in the first year

Staff from the Department's Merredin District, are liaising with land managers and landowners to ensure that populations are not accidentally damaged or destroyed.

4. Liaise with relevant land managers

Staff from CALM's Merredin District will continue to liaise with managers and owners of land on which populations of *Acacia ataxiphylla* subsp. *magna* occur, and with managers of adjacent land. This will help prevent accidental damage or destruction of the plants. In addition, the possibility of conservation covenants will be discussed with interested land owners as a method of improving the security of populations and their habitat. Five populations and two subpopulations currently occur on private property. Input and involvement will also be sought from any indigenous groups that have an active interest in areas that are habitat for *Acacia ataxiphylla* subsp. *magna.*

Populations 2b and 10 are located on areas that are threatened by continuing disturbance. Population 2b occurs on a firebreak and Population 10 on the edge of a track next to an old gravel extraction pit and water standpipe. Discussions with the relevant land owners regarding the security of these populations are ongoing.

Action: Liaise with relevant land managers
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $500 per year

5. Maintain fences around populations in private property

Fences around Populations of *Acacia ataxiphylla* subsp. *magna* on private land must be maintained to prevent grazing by stock and accidental damage to remnant vegetation by vehicles. Fencing is under construction around Subpopulation 2b, however, Population 5 is currently not fenced from roadside access and discussions will continue with the land owner regarding the erection of a protective fence. Populations 7a, b and c occur on

a large block that has several areas of remnant vegetation. CALM officers will assist the land owner who has requested covenant information for fencing assistance.

Action: Maintain fences around populations in private property
Responsibility: CALM (Merredin District) and private land-owners through the MDTFRT
Cost: $2,000 per year

6. Install bollards to protect Subpopulation 2a

Subpopulation 2a is located on a road reserve that is used as a vehicle lay-by. The Merredin District Conservation Officer will liaise with officers from the Shire of Cunderdin to have bollards installed as a barrier between the lay-by and the vegetation containing *Acacia ataxiphylla* subsp. *magna*.

Action: Install bollards to protect Subpopulation 2a
Responsibility: CALM (Merredin District) and the Shire of Cunderdin through the MDTFRT
Cost: $2,000 in first year

7. Collect seed and cutting material

Preservation of germplasm is essential to prevent extinction if wild populations are lost. Seed and cuttings will be collected for storage and for use in propagating plants for future translocations. A quantity of *Acacia ataxiphylla* subsp. *magna* seed has been collected and is currently held in CALM's Threatened Flora Seed Centre and one plant is held in the nursery at KPBG. Further seed and cutting collections from as many populations as possible are needed to maximise the genetic diversity of *ex situ* material and to establish a living collection at the BGPA.

Action: Collect seed and cutting material
Responsibility: CALM (TFSC, Merredin District) KPBG through the MDTFRT
Cost: $3,000 per year.

8. Develop and implement a rabbit control strategy

Rabbits have been recorded as a threat to four populations of *Acacia ataxiphylla* subsp. *magna* and CALM officers have noted grazing as a possible threat to two others populations. Rabbits are known to preferentially graze soft young growth, therefore it seems likely that they will impact on recruitment of plants by grazing on seedlings. In addition to grazing, rabbits also impact on populations by encouraging invasion of weeds through soil digging, erosion, addition of nutrients to soil and introduction of weed seeds.

Control strategies will be developed and implemented in consultation with relevant land managers. This may include using the naturally occurring chemical 1080 in an oat mixture, which will decrease the numbers of rabbits and, through secondary poisoning, of foxes.

Action: Develop and implement a rabbit control strategy
Responsibility: CALM (Merredin District) and land managers through the MDTFRT
Cost: $2,500 in first year then $1,000 for second and third years.

9. Develop and implement a weed control strategy

Weeds are a threat to roadside populations of *Acacia ataxiphylla* subsp. *magna* and also Populations 2b and 10 on private land. Weeds impact on the species by competing for resources, degrading habitat, exacerbating grazing pressure, and increasing the risk and severity of fire.

Weed control will be undertaken in consultation with the land managers. This will be by hand weeding or localised application of herbicide during the appropriate season to minimise the effect of herbicide on the species and the surrounding native vegetation. All applications of weed control will be followed by a report on the method, timing and success of the treatment, and its effect on *A. ataxiphylla* subsp. *magna* and associated

native plant species. It is anticipated that a number of native species will regenerate after weed competition is removed.

Action: Develop and implement a weed control strategy
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $2,000 in first year then $1,800 per year

10. Develop and implement a fire management strategy

It is likely that *Acacia ataxiphylla* subsp. *magna* requires occasional fire to stimulate recruitment from soil-stored seed. However, fire is known to kill adult plants and frequent fires would be detrimental to the species' long-term survival if they prevent the accumulation of sufficient soil-stored seed for recruitment to occur. Fire also promotes the introduction and proliferation of weed species and should therefore be prevented from occurring in the area of populations, except where it is being used as a recovery tool.

A fire management strategy will be developed in consultation with relevant authorities and land managers to determine fire control measures and fire frequency. This strategy should incorporate other priority and threatened flora species in the district.

Action: Develop and implement a fire management strategy
Responsibility: CALM (Merredin District) and relevant authorities through the MDTFRT
Cost: $4,200 in first year and $2,000 in second and third years.

11. Investigate purchase of land to extend habitat

Population 12 occurs on a degraded road reserve. CALM's Merredin District Conservation Officer will investigate purchasing a 20-30m corridor of private property to increase area of habitat and decrease the edge effect. Narrow linear populations such as road and rail reserves are severely affected by influences from adjacent cleared land, commonly referred to as edge effects (Saunders *et al.* 1987).

Populations 7a, b and c occur within areas of remnant vegetation on private property immediately north of a Conservation Reserve. As one of the largest populations of *Acacia ataxiphylla* subsp. *magna* occurs on one of these remnants the possibility of purchasing them for inclusion into the Reserve should be investigated.

Action: Investigate purchase of land to extend habitat
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $800

12. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Acacia ataxiphylla* subsp. *magna* will provide a better scientific basis for its management in the wild. An understanding of the following is particularly necessary for effective management:

1. Soil seed bank dynamics and the role of various disturbances (including fire), competition, rainfall and grazing on germination and recruitment.
2. The pollination biology of the subspecies.
3. The requirements of pollinators.
4. The reproductive strategies, phenology and seasonal growth of the subspecies.
5. The population genetic structure, levels of genetic diversity and minimum viable population size.
6. The impact of herbicide treatments on *Acacia ataxiphylla* subsp. *magna* and its habitat.

Action: Obtain biological and ecological information
Responsibility: CALM (Science Division, Merredin District) through the MDTFRT
Cost: $20,000 in second and third years then $11,500 in fourth year.

13. Promote community awareness

Information on *Acacia ataxiphylla* subsp. *magna* was provided to threatened flora volunteers in the Shire of Quairading by the Department's Narrogin District Office to assist in identifying new populations. Awareness of the importance of biodiversity conservation and the need for long-term protection of wild populations of this subspecies will be promoted throughout the community. Formal links with local naturalist groups and interested individuals will also be encouraged.

An information sheet will be produced that includes a description of the plant, its habitat, threats, recovery actions and photos. This will be distributed to the public through CALM's Merredin District Office and at the offices and libraries of the Shires of Cunderdin, Tammin and Quairading. It is hoped that this may lead to the discovery of new populations. The preparation of a poster illustrating all Critically Endangered flora species in the District is recommended. Posters aim to stimulate interest, provide information about threatened species and provide a contact name and number to report any findings of new populations by community members.

Action: Promote community awareness
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $2,800 in first year, $1,400 in second year and $1,100 per year.

14. Monitor populations

Annual monitoring of habitat degradation (including weed invasion, salinity and plant diseases), population stability (expansion or decline), pollination activity, seed production, recruitment, longevity and predation is essential.

Action: Monitor populations
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $2,200 per year

15. Conduct further surveys

Volunteers from the local community, Wildflower Societies, Naturalist Clubs and other community-based groups will be encouraged to undertake surveys for *Acacia ataxiphylla* subsp. *magna*. CALM staff will also conduct surveys, particularly during the species' flowering period (June to September).

Action: Conduct further surveys
Responsibility: CALM (Merredin District) through the MDTFRT
Cost: $2,000 per year

16. Review the need for a full Recovery Plan

This Interim Recovery Plan will operate from November 2003 to October 2008 at which time it will be reviewed and the need for further recovery actions assessed. It will however, remain in force until withdrawn or replaced and if the species is still ranked as Critically Endangered at that time, a full Recovery Plan may be required.

Action: Review the need for further recovery actions and/or a full Recovery Plan
Responsibility: CALM (WATSCU, Merredin District) through the MDTFRT
Cost: $15,000 in the fifth year (if full Recovery Plan is required)

4. TERM OF PLAN

This Interim Recovery Plan will operate from November 2003 to October 2008 but will remain in force until withdrawn or replaced. If the taxon is still 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. REFERENCES

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6. TAXONOMIC DESCRIPTION

Maslin, B.R. *Acacia ataxiphylla* subsp. *magna*, *Flora of Australia*, 11A : 516 (2001)

Acacia ataxiphylla* subsp. *magna

Spreading subshrub to c. 0.3 m high, with ascending to erect branches. Branchlets tomentulose and flattened or angled at extremities, glabrescent. Phyllodes somewhat coarse, mostly 40-60 mm long, infrequently 20-30 mm long, 1.6-2 mm wide. Peduncles 4-7 mm long, ±stout, 0.5-0.8 mm diam. (when dry), tomentulose; heads 7-9 mm diam. (when dry), c. 20-flowered; bracteoles 2-2.5 mm long. Calyx ¾ to fully the length of the corolla; petals 2.5-3 mm long, nerveless or faintly flabellate-striate and lacking a central nerve. May resemble some forms of *A. stenoptera*.

Australian Government

Department of the Environment and Heritage

ADDENDUM

Large-Fruited Tammin Wattle (*Acacia ataxiphylla* subsp. *magna*) Interim Recovery Plan 2003-2008

In adopting this plan under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Minister for the Environment and Heritage has approved the addition of the following information.

Critical Habitat

The plan identifies critical habitat as including areas located a set distance around known populations which contain habitat similar to that in which the species occurs, as well as areas that do not currently contain the species but may have done so in the past. These areas identified in the plan do not represent areas of critical habitat as defined under section 207A of the EPBC Act, nor do they represent habitats that are critical to the survival of the species identified pursuant to Section 270(2)(d) of the EPBC Act. Habitats identified in Section 270(2)(d) are limited to the area of occupancy of known populations.