Woolly Wattle

(*Acacia lanuginophylla*)

RECOVERY PLAN

Department of Environment and Conservation
Species and Communities Branch (SCB)
Kensington

Australian Government

Government of Western Australia

Department of Environment and Conservation

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. Note: the Department of CALM formally became the Department of Environment and Conservation (DEC) in July 2006. DEC will continue to adhere to these Policy Statements until they are revised and reissued.

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.

DEC is committed to ensuring that Threatened taxa are conserved through the preparation and implementation of Recovery Plans (RPs) or IRPs, and by ensuring that conservation action commences as soon as possible and, in the case of Critically Endangered (CR) taxa, always within one year of endorsement of that rank by the Minister.

This IRP will operate from February 2008 to January 2013 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked CR, this IRP will be reviewed after five years and the need for further recovery actions assessed.

This IRP was given regional approval on 17 January 2008 and approved by the Director of Nature Conservation on 6 February 2008. The allocation of staff time and provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this IRP was accurate in February 2008

IRP PREPARATION

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ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this IRP:

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Joel Collins	Flora Conservation Officer, Yilgarn District, DEC
Andrew Brown	Threatened Flora Coordinator, Species and Communities Branch, DEC
Luke Sweedman	Curator, Western Australian Seed Technology Centre, Botanic Gardens and Parks Authority
Bob Elkins	Technical Assistant, Botanic Gardens and Parks Authority

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

CITATION

This Recovery Plan should be cited as:

Department of Environment and Conservation (2008). Woolly Wattle (*Acacia lanuginophylla* Recovery Plan. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name:	***Acacia lanuginophylla***	**Common Name:**	Woolly Wattle
Family:	Mimosaceae	**Flowering Period:**	July - October
DEC Region:	Wheatbelt	**DEC District:**	Katanning and Yilgarn
Shire:	Lake Grace and Yilgarn	**Recovery Team:**	Katanning and Yilgarn District Threatened Flora Recovery Teams

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. pp 63; Maslin, B.R, (2001). *Mimosaceae, Acacia part 2. Flora of Australia Volume 11B.* Melbourne: ABRS/CSIRO Publishing: pp 32; Cowan, R.S. and Maslin, B.R. (1990). Acacia Miscellany 1. Some oligoneurous species of *Acacia* (Leguminosae: Mimosoideae: Section *Plurinerves*) from Western Australia. *Nuytsia* **7(2)**: 194; *Western Australian Herbarium FloraBase 2 – Information on the Western Australian Flora*. Department of Conservation and Environment, Western Australia. Accessed 2006. http://www.calm.wa.gov.au/science/

Current status: *Acacia lanuginophylla* was declared as Rare Flora in 1991 under the Western Australian *Wildlife Conservation Act 1950* and is currently ranked as Vulnerable (VU) under World Conservation Union (IUCN 2001) Red List criterion D2 due to its restricted distribution and number of locations. *Acacia lanuginophylla* is listed as Endangered under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). The main threats are senescence and the lack of a suitable disturbance regime, road, rail, powerline and firebreak maintenance, salinity, clearing of grade banks for water catchment, rubbish dumping, and stock degradation and grazing.

Acacia lanuginophylla is known from nine populations (fifteen subpopulations) totaling 5483 plants in the Shires of Lake Grace and Yilgarn. Ninety eight percent of plants are located in DEC's Katanning District and two percent in its Yilgarn District. In this area, seventy five percent of native vegetation has been cleared for agriculture (Beeston *et al*. 1996).

Since 1991, the number of mature *Acacia lanuginophylla* plants in wild populations has decreased from a high of over 10,000 to the current 5483 plants, a decrease of over 45%. The reduction in the number of mature plants is believed to be due to senescence and poor recruitment resulting from a lack of suitable soil disturbance such as fire stimulating germination of soil stored seed.

One population and eight subpopulations of *Acacia lanuginophylla* occur in disturbed ground on road reserves (subpopulations 1b, 5b, 5c, 5e, 6a, and Population 8), rail reserves (subpopulations 1a), and water reserves (subpopulations 5a and 5d); two populations and five subpopulations are located on private property (populations 7 and 9; subpopulations 2b, 5f, 6b-d); two populations are located on Unallocated Crown Land (populations 3 and 4), and two subpopulations are located in nature reserves (subpopulations 2a and 2c). Thus, a total of 88% of plants are on private property, 4% in water reserves, 3% in nature reserves, 2% on Unallocated Crown Land, 1.4% on rail reserves and 0.6% on road reserves.

Description: *Acacia lanuginophylla* is a small to medium shrub 0.5 to 1.2 m high, dense to open, domed, erect or spreading. The branchlets are densely white-woolly, with new shoots yellow-green. The phyllodes are narrowly elliptic to narrowly oblong-oblanceolate, 1.5 to 4 cm long, 3.5 to10 mm wide, greyish green, densely woolly, with three main longitudinal nerves and with prominent longitudinal secondary nerves connecting with one another in between, the venation is obscured by indumentum, the gland is 2 to 6 mm above an enlargement below the base of the leaf. The inflorescences are simple, one per axil, the peduncles 2 to 4 mm long and woolly, the basal bract is persistent, the heads globular, 5 to 7 mm in diameter, thirty to thirty one flowered and golden, the bracteoles have a stalk, and are ovate, taper slightly to a protracted point, and protrude in the bud. The flowers are five-merous and the sepals free. The pods are oblong, up to 2.5 cm long, and 6 to 7 mm wide, they are hard, thin and brittle, with dense woolly hair. The seeds are elliptic, 3 mm long and tan, the aril is subapical (Maslin 2001).

Acacia lanuginophylla is closely related to *Acacia cassicula*, but is distinguished by the dense, woolly hair that covers most parts of the plant including the pods (Maslin 2001).

Habitat requirements: *Acacia lanuginophylla* occurs in broad drainage channels in areas of open mallee over low scrub. Soils are sand overlying loams and clays.

Habitat critical to the survival of the species, and important populations: Given that *Acacia lanuginophylla* is ranked as Endangered (EPBC Act), it is considered that all known habitat for wild populations is critical to the species survival, and that all wild populations are important populations. Habitat critical to the survival of *A. lanuginophylla* includes the area of occupancy of extant populations, areas of similar habitat (i.e sand overlying loams and clays in broad drainage channels supporting open mallee over low scrub), remnant vegetation that surrounds populations (this is necessary to allow maintenance and access for pollinators) and additional occurrences of similar habitat that may contain the species or be suitable for future translocations.

Benefits to other species or ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Acacia lanuginophylla* will also improve the status of associated native vegetation which is dominated by *Eucalyptus salmonophloia, E. calycogona, Melaleuca uncinata, M. acuminata* and *M. elliptica.* Three other threatened and priority flora occur with *A. lanuginophylla* and these are listed in the table below.

Threatened and Priority flora species occurring in habitat of *Acacia lanuginophylla*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act 1999)
Acacia auratiflora	DRF, Vulnerable	Endangered
Eremophila veneta ms	Priority 4	Endangered
Bentleya spinescens	Priority 4	Endangered

For a description of the Priority categories see Atkins (2005), DRF – Declared Rare Flora.

International obligations: This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity that was ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that convention. *Acacia lanuginophylla* is not listed under any specific international treaty however, and therefore this recovery plan does not affect Australia's obligations under any other international agreements.

Role and interests of Indigenous people: Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Acacia lanuginophylla*, or Indigenous groups with a cultural connection to land that is important for the species' conservation and to determine whether there are issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this recovery plan. Where no role is identified in the development of the recovery plan for the Indigenous community associated with *Acacia lanuginophylla*, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the Indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact: The implementation of this recovery plan is unlikely to cause significant adverse social and economic impacts. However, as some populations are located on private property, their protection has the potential to affect farming activities. Where populations are located on private property, recovery actions refer to continued liaison between stakeholders with regard to these areas.

Affected interests: Stakeholders potentially affected by the implementation of this plan include WestNet Rail, the Shire of Lake Grace and owners of private property.

Evaluation of the plan's performance: DEC in conjunction with the Katanning and Yilgarn District Threatened Flora Recovery teams will evaluate the performance of this recovery plan. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following four years of implementation.

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

1. Land managers including private land owners, WestNet Rail and Shires with populations on their property have been made aware of the threatened nature of this species, its location and their legal obligations to protect it.
2. Declared Rare Flora (DRF) markers have been installed at Populations 1a, 1b, 2a, 2c, 5b, 5c, 6a and 8.
3. Population 2b, Population 7 (in part), and Population 9 have been fenced from stock.
4. The Botanic Gardens and Parks Authority (BGPA) and DEC's Threatened Flora Seed Centre (TFSC) have seed in storage.
5. The Yilgarn District Threatened Flora Recovery Team (YDTFRT) and Katanning District Threatened Flora Recovery Team (KDTFRT) are overseeing the implementation of this recovery plan and will include information on progress in their annual reports to DEC's Corporate Executive and funding bodies.
6. Staff from DEC's Katanning and Yilgarn Districts are monitoring all known populations.

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

Recovery criteria

Criteria for success: The number of populations have increased and/or the number of mature individuals have increased by ten percent or more over the five year term of the plan.

Criteria for failure: The number of populations have decreased and/or the number of mature individuals have decreased by ten percent or more over the five year term of the plan.

Recovery actions

1. Coordinate recovery actions
2. Monitor populations
3. Liaise with relevant land managers
4. Conduct further surveys
5. Fence populations
6. Install DRF markers
7. Collect seed and other material to preserve genetic diversity
8. Develop and implement fire and disturbance trials
9. Develop and implement a fire management strategy
10. Seek security of tenure
11. Obtain biological and ecological information
12. Undertake weed control
13. Map habitat critical to the survival of *Acacia lanuginophylla*
14. Promote awareness
15. Review the recovery plan and the need for further recovery actions

1. BACKGROUND

History

Acacia lanuginophylla was described by Cowan and Maslin in 1990 from a collection made at Mount Holland in September 1929 by C.A. Gardner. It had previously (1939) been invalidly published by Gardner as *Acacia lanuginosa* (Cowan & Maslin 1990).

Acacia lanuginophylla is currently known from nine populations (fifteen subpopulations) totaling 5483 plants in DEC's Katanning and Yilgarn Districts. Seventy five percent of native vegetation in this area has been cleared for agriculture (Beeston *et al*. 1996).

Description

Acacia lanuginophylla is a medium shrub 0.5 to 1.2 m high, dense to open, domed, erect or spreading. The branchlets are densely white-woolly, with new shoots yellow-green. The phyllodes are narrowly elliptic to narrowly oblong-oblanceolate, 1.5 to 4 cm long, 3.5 to10 mm wide, greyish green, densely woolly, with three main longitudinal nerves and with prominent longitudinal secondary nerves connecting with one another in between, the venation is obscured by indumentum, the gland is 2 to 6 mm above an enlargement below the base of the leaf. The inflorescences are simple, one per axil, the peduncles 2 to 4 mm long and woolly, the basal bract is persistent, the heads globular, 5 to 7 mm in diameter, thirty to thirty one flowered and golden, the bracteoles have a stalk, and are ovate, taper slightly to a protracted point, and protrude in the bud. The flowers are five-merous and the sepals free. The pods are oblong, up to 2.5 cm long, and 6 to 7mm wide, they are hard, thin and brittle, with dense woolly hair. The seeds are elliptic, 3 mm long and tan, the aril is subapical (Maslin 2001).

Acacia lanuginophylla is closely related to *Acacia cassicula*, but is distinguished by the dense, woolly hair that covers most parts of the plant (Maslin 2001).

Distribution and habitat

Acacia lanuginophylla is found in the Shires of Lake Grace and Yilgarn in Western Australia's south eastern Wheatbelt.

The species occurs in broad drainage channels in areas of open mallee over low scrub with *Eucalyptus salmonophloia, E. calycogona, Melaleuca uncinata, M. acuminata* and *M. elliptica*. Soils are sand overlying loams and clays.

Summary of population land vesting, purpose and tenure

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1a NW of Newdegate	Katanning	Lake Grace	Public Transport Authority	Rail Reserve	WestNet Rail
1b NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace
2a S of Newdegate	Katanning	Lake Grace	Conservation Commission of Western Australia	Conservation of Flora and Fauna	DEC
2b S of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
2c S of Newdegate	Katanning	Lake Grace	Conservation Commission of Western Australia	Conservation of Flora and Fauna	DEC
3 Along the Notting Boundary Mine-Cosmic Boy transmission route.	Yilgarn	Yilgarn	Unallocated Crown Land	_	DPI & DEC
4 Along the Kondinin to Bounty Gold Mine power line.	Yilgarn	Yilgarn	Unallocated Crown Land	_	DPI & DEC
5a NW of Newdegate	Katanning	Lake Grace	Minister for Water Resources	Water Conservation	DEC
5b NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace
5c NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace

5d NW of Newdegate	Katanning	Lake Grace	Minister for Water Resources	Water Conservation	DEC
5e NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace
5f NW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
5g NW of Newdegate	**Katanning**	**Lake Grace**	**Freehold**	**Private property**	**Landholders**
6a NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace
6b NW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
6c NW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
6d NW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
7 NW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders
8 NW of Newdegate	Katanning	Lake Grace	Unvested reserve	Road Reserve	Shire of Lake Grace
9 SW of Newdegate	Katanning	Lake Grace	Freehold	Private Property	Landholders

Populations in **bold text** are considered to be Important Populations

Biology and ecology

Like most other species of *Acacia*, *Acacia lanuginophylla* requires fire to stimulate germination of soil stored seed. Healthy levels of germination have been observed following summer burns.

Acacia lanuginophylla is not salt tolerant, but appears to withstand short-term fresh water inundation of habitat (Brown *et al.* 1998).

Acacia lanuginophylla flowers between July and October with fruit appearing on plants in November/December.

Threats

Acacia lanuginophylla was declared as Rare Flora in 1991 under the *Western Australian Wildlife Conservation Act 1950* and is currently ranked as Vulnerable (VU) under World Conservation Union (IUCN 1994) Red List criteria D2, due to the species being restricted on its area of occupancy and number of locations. *A. lanuginophylla* is listed as Endangered under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). The main threats are senescence and the lack of a suitable disturbance regime, road, rail, powerline and firebreak maintenance, salinity, clearing of grade banks for water catchment, rubbish dumping, and stock degradation and grazing.

- **Senescence and the lack of a suitable disturbance regime.** The absence of suitable disturbance such as fire has seen populations of *Acacia lanuginophylla* senesce and the number of mature plants decrease from a high of over 10,000 plants in 1991 to a current 5483, a decrease of over 45% in the number of mature plants.
- **Road maintenance** including grading, weed spraying and slashing threatens Population 8 and subpopulations 1b, 5b, 5c, 5e and 6a. Apart from causing direct damage to plants, such activities may also encourage weed invasion.
- **Rail maintenance** including grading and spraying of vegetation and maintenance of drainage lines threatens Subpopulation 1a.
- **Powerline maintenance** threatens Population 4.
- **Firebreak maintenance** threatens Population 7 and subpopulations 2a, 6b and d. Populations located on or adjacent to firebreaks are threatened by grading.
- **Salinity** is recorded as a minor threat to Subpopulation 2a. *Acacia lanuginophylla* is not salt tolerant (Brown *et al*. 1998) and salinity threatens not only it but also associated native vegetation.
- **Clearing of grade banks for water catchment** is recorded as a threat to Subpopulation 5a through clearing of the grade banks that channel water in to the dam.
- **Rubbish dumping** is recorded as a threat to Subpopulation 5e. Such activities reduce plant health and the health of surrounding native vegetation.
- **Stock degradation and grazing** potentially threatens subpopulations 5f and 6c. Soil disturbance, erosion, weed invasion and the addition of nutrients are all effects of animal movement in areas inhabited by *Acacia lanuginophylla*. The species' preference for areas along drainage lines (Brown *et al.* 1998) that are also favored areas for stock routes, places its habitat under heavy pressure.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants	Condition	Threats
1a NW of Newdegate	Rail Reserve	1986 8 1990 9 1997 48 (7) 2000 49 [1]	Moderate	Rail maintenance
1b NW of Newdegate	Road Reserve	2000 12 (2)	Healthy	Road maintenance
2a S of Newdegate	Nature Reserve	1991 2000 1993 2000 1996 138 (11) [2]* 2000 35 (4) [2]	Moderate	Firebreak maintenance, salinity
2b S of Newdegate	Private Property	1991 8000 1996 1845 (7) [17]	Healthy	
2c S of Newdegate	Nature Reserve	1991 1 1993 8 (2) 1996 138 (11) [2]*	Healthy	Firebreak maintenance
3 Along the Notting-Boundary Mine-Cosmic Boy transmission route.	Unallocated Crown Land	1997 20 (100)	Healthy	Transmission Line clearing line maintenance
4 Along the Kondinin to Bounty Gold Mine power line.	Unallocated Crown Land	2003 100	Healthy	Powerline maintenance activities
5a NW of Newdegate	Water Reserve	1999 30 2000 226 (10)	Healthy	Road maintenance, clearing of grade banks for water catchment
5b NW of Newdegate	Road Reserve	1999 30 2000 7	Moderate	Road maintenance
5c NW of Newdegate	Road Reserve	1999 1 2000 1	Moderate	Road maintenance
5d NW of Newdegate	Water Reserve	2000 5 (1)	Moderate	
5e NW of Newdegate	Road Reserve	2000 14 (1)	Moderate	Rubbish dumping
5f NW of Newdegate	Private Property	2000 20 2007 0	None seen	Stock degradation
5g NW of Newdegate	Private Property	2007 0	None seen	
6a NW of Newdegate	Road Reserve	2000 29 [1]	Healthy	Road maintenance
6b NW of Newdegate	Private Property	2000 100	Healthy	Firebreak maintenance, Farming activities
6c NW of Newdegate	Private Property	2000 6	Moderate	Stock degradation
6d NW of Newdegate	Private Property	2000 1	Healthy	Firebreak maintenance
7 NW of Newdegate	Private Property	2000 355	Healthy	Firebreak maintenance, farming activities
8 NW of Newdegate	Road Reserve	2000 1	Healthy	Road maintenance
9 SW of Newdegate	Private Property	2004 2519 (40) [7]	Healthy	

Populations in **bold text** are considered to be Important Populations, Note: * = total for both subpopulations, ( ) = number of seedlings, [ ] = number dead

Guide for decision-makers

The above table provides details of current and possible future threats. Proposed actions in the immediate vicinity of any of the populations of *Acacia lanuginophylla* require assessment for the potential for a significant level of impact on the species.

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

Given that *Acacia lanuginophylla* is ranked as Endangered (EPBC Act), it is considered that all known habitat for wild populations is habitat critical to the survival of the species, and that all wild populations are important populations. Habitat critical to the survival of *A. lanuginophylla* includes the area of occupancy of extant populations, areas of similar habitat surrounding populations (i.e. sand overlying loams and clays in broad drainage channels supporting open mallee over low scrub - this is necessary to allow maintenance and access for pollinators), and additional occurrences of similar habitat that may contain the species or be suitable for future translocations.

Benefits to other species or ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Acacia lanuginophylla* will also improve the status of associated native vegetation which is dominated by *Eucalyptus salmonophloia*, *E. calycogona*, *Melaleuca uncinata*, *M. acuminata* and *M. elliptica*. Three other threatened and priority flora are located with *A. lanuginophylla* and these are listed in the table below.

Threatened and Priority flora species occurring in habitat of *Acacia lanuginophylla*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act 1999)
Acacia auratiflora	DRF, Vulnerable	Endangered
Eremophila veneta ms	Priority 4	Endangered
Bentleya spinescens	Priority 4	Endangered

For a description of the Priority categories see Atkins (2005), DRF – Declared Rare Flora.

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 lanuginophylla* is not listed under any specific international treaty and this recovery plan does not affect Australia's obligations under any other international agreements.

Role and interests of Indigenous people

Involvement of the Indigenous community is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Acacia lanuginophylla*, or Indigenous groups with a cultural connection to land that is important for the species' conservation and to determine whether there are issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this recovery plan. Where no role is identified in the development of the recovery plan for the Indigenous community associated with *Acacia lanuginophylla*, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the Indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact

The implementation of this recovery plan is unlikely to cause significant adverse social and economic impacts but, as some populations are located on private property, their protection has the potential to affect farming activities. Where populations are located on private property, recovery actions refer to continued liaison between stakeholders with regard to these areas.

Affected interests

Stakeholders potentially affected by the implementation of this plan include WestNet Rail, the Shires of Lake Grace and Yilgarn and owners of private property.

Evaluation of the plan's performance

DEC in conjunction with the Katanning and Yilgarn District Threatened Flora Recovery teams (KDTFRT and YDTFRT) will evaluate the performance of this recovery plan. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed within five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

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

Criteria for success: The number of populations have increased and/or the number of mature individuals have increased by ten percent or more over the five year term of the plan.
Criteria for failure: The number of populations have decreased and/or the number of mature individuals have decreased by ten percent or more over the five year term of the plan.

3. RECOVERY ACTIONS

Existing recovery actions

Land managers, including private land owners, the Shires of Lake Grace and Yilgarn and WestNet Rail have been made aware of the threatened nature of the species, its location and their legal obligations to protect it.

Declared Rare Flora (DRF) markers have been installed at populations 1a, 1b, 2a, 2c, 5b, 5c, 6a and 8.

Fencing of Population 2b, Population 7 (in part) and Population 9 has been undertaken to protect them from stock.

The Botanic Gardens and Parks Authority (BGPA) has 142.85g of seed in storage that was collected from plants growing in the Botanic Gardens. DEC's Threatened Flora Seed Centre (TFSC) has a small amount of seed that was collected from Population 1b in December 2005.

The YDTFRT and KDTFRT are overseeing the implementation of this recovery plan and will include information on progress in their annual reports to DEC's Corporate Executive and funding bodies.

Staff from DEC's Katanning and Yilgarn Districts regularly monitor all known populations.

Future recovery actions

Where recovery actions are implemented on lands other than those managed by DEC, permission has been or will be sought from the appropriate land managers prior to actions being undertaken. The following recovery actions are roughly in order of descending priority, influenced by their timing over the term of the plan. However this should not constrain addressing any recovery action if funding is available and other opportunities arise.

1. Coordinate recovery actions

The KDTFRT and YDTFRT will continue to coordinate the implementation of recovery actions for *Acacia lanuginophylla* and will include information on progress in their annual reports to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: YDTFRT and KDTFRT
Cost: $2,800 per year

2. Monitor populations

Monitoring of factors such as weed invasion, habitat degradation, population stability (expansion or decline), pollinator activity, seed production, recruitment, and longevity is essential. Populations will be inspected annually and Rare Flora Report Forms completed.

Action: Monitor populations
Responsibility: DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT
Cost: $2,700 per year

3. Liaise with relevant land managers

Staff from DEC's Katanning and Yilgarn Districts will liaise with appropriate land owners to ensure that populations are not accidentaly damaged or destroyed. Input and involvement will also be sought from any Aboriginal groups that have an active interest in areas that are habitat for *Acacia lanuginophylla*.

Action: Liaise with relevant land managers
Responsibility: DEC (Katanning and Yilgarn Districts), through the KDTFRT and YDTFRT
Cost: $2,200 per year

4. Conduct further surveys

All known populations of *Acacia lanuginophylla* will be resurveyed to ascertain accurate boundaries and ensure that no plants have been missed during previous surveys. More extensive survey of vegetation surrounding Population 7 and subpopulations 2a and 6d is necessary. Subpopulations 2b and 2c were last surveyed in 1996 and Population 3 in 1997 and require resurveying to accurately gauge population size and health. This will be done during the species flowering period between July and October, with assistance from local naturalists and volunteers.

It is suggested that surveys be done in conjunction with surveying other possible areas of suitable habitat within the Shires of Lake Grace and Yilgarn for new populations. These surveys should include appropriate habitat on private land if possible. Volunteers from the local community, wildflower societies and naturalists clubs could be involved in surveys supervised by DEC staff.

Action: Conduct further surveys
Responsibility: DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT
Cost: $2,300 in the first year, $1,500 in years 2 to 5

5. Fence populations

Fencing of Population 7 and Subpopulations 5f and 6b to d on private property is required. Populations are threatened by grazing and degradation of habitat by stock.

Actions: Fence populations
Responsibility: DEC (Katanning District) through KDTFRT
Cost: $2,400 in the third year

6. Install DRF markers

Declared Rare Flora (DRF) markers are required at Population, 3 and Subpopulation 5a.

Actions: Install DRF markers
Responsibility: DEC (Katanning and Yilgarn Districts) through the KDTFRT and the YDTFRT
Cost: $600 in the first year

7. Collect seed and other material to preserve genetic diversity

A small amount of seed has been collected for storage at BGPA and DEC's TFSC. These collections only sample a few populations and more substantial collections are needed to preserve a greater range of genetic diversity. Consideration should be given to holding material in a variety of forms, including seed storage, living collections and tissue culture. The "Germplasm Conservation Guidelines for Australia" produced by the ANPC should be used to guide this process.

Actions: Collect seed and other material to preserve genetic diversity
Responsibility: DEC (Katanning and Yilgarn Districts, TFSC), and BGPA through the KDTFRT and YDTFRT
Cost: $3,700 in years 1, 3 and 5.

8. Develop and implement fire and disturbance trials

Acacia lanuginophylla, like many other species of *Acacia*, requires fire to stimulate the germination of soil stored seed and it is important that a fire regime with appropriate fire intensity, frequency and seasonality occurs to maximize population size and health.

DEC's Katanning and Yilgarn Districts will, in consultation with private landowners and the Shires of Lake Grace and Yilgarn, develop and implement burn and disturbance trials to stimulate germination. Care will be taken to avoid stimulating competition with existing *Acacia lanuginophylla* plants. The results of all trials will be monitored regularly and, if successful, a larger scale operation undertaken. Attention will be given to each of the following to ensure maximum recruitment but at the same time maintaining the integrity of the population:

1. Burning discrete dead plants
2. Raking of the soil near dead plants

Action: Develop and implement fire and disturbance trials
Responsibility: DEC (Science Division, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT, and relevant authorities
Cost: $7,000 in the first year, $5,600 in years 3 and 5

9. Develop and implement a fire management strategy

Although occasional fire is required to stimulate the germination of soil stored seed, frequent prescribed burning and uncontrolled wild fires may adversely impacting on populations. A fire management strategy is therefore needed and will be addressed under this action.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT, and relevant authorities.
Cost: $5,500 in the first year

10. Seek security of tenure

The conservation status of land that supports Population 5a, vested with the Minister for Water Resources and land supporting populations 2b, 6b, 7 on private property will be reviewed and the possibility of additional protection through the reservation system investigated. Protecting important populations on private property through conservation covenants or registration with the Land for Wildlife or other support programs will also be investigated.

Action: Seek security of tenure
Responsibility: DEC (Katanning District) through the KDTFRT
Cost: $1,500 in years 3 and 4

11. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Acacia lanuginophylla* will provide a better scientific basis for managing wild populations. An understanding of the following is particularly necessary for effective management:

1. Optimal fire frequency and intensity to maximise population size and health
2. Appropriate herbicides for weed control that will not adversely affect *Acacia lanuginophylla.*
3. Size of soil seed banks

4. Seed viability and germination rate
5. Pollination biology and method of seed dispersal

Action: Obtain biological and ecological information
Responsibility: DEC (Science Division, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT
Cost: $8,600 in years 2 and 3

12. Undertake weed control

As weeds are a threat to several populations of *Acacia lanuginophylla* the following actions will be implemented:

1. Selection of appropriate herbicides after determining which weeds are present
2. Controlling invasive weeds by hand removal or spot spraying around *Acacia lanuginophylla* plants when weeds first emerge.
3. Scheduling weed control to include spraying at other threatened flora populations within the district

The tolerance of associated native plant species to herbicides at the site of *Acacia lanuginophylla* is not known and weed control programs will be undertaken in conjunction with research.

Action: Undertake weed control
Responsibility: DEC (Katanning and Yilgarn Districts, Science Division) through the KDTFRT and YDTFRT
Cost: $3,500 per year

13. Map habitat critical to the survival of *Acacia lanuginophylla*

Although habitat critical to the survival of the species is described in Section 1, the areas described have not yet been mapped and this will be addressed under this action. If any additional populations are located, then critical habitat will also be determined and these locations mapped.

Action: Map habitat critical to the survival of *Acacia lanuginophylla*
Responsibility: DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT
Cost: $3,000 in the first year

14. Promote awareness

An information sheet that provides a description of the species and information about threats and recovery actions needs to be developed for *Acacia lanuginophylla* and distributed to local land owners, relevant authorities, volunteer organizations, libraries and schools. It is hoped that the poster will result in the discovery of new populations. In conjunction with this, a publicity campaign will be run to increase local community awareness of this threatened species. Formal links with local naturalist groups and interested individuals should also be encouraged.

Action: Promote awareness
Responsibility: DEC (Katanning and Yilgarn Districts, Species and Communities Branch (SCB) and Strategic Development and Corporate Affairs Division) through the KDTFRT and YDTFRT
Cost: $1,600 in the first year, $1,000 in years 3 and 5

15. Review the recovery plan and the need for further recovery actions

At the end of the fourth year of its five-year term this recovery plan will be reviewed and the need for further recovery actions assessed.

Action: Review the recovery plan and the need for further recovery actions

Responsibility: DEC (SCB, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT
Cost: $1,500 in the fifth year

Summary of recovery actions

Recovery Actions	Priority	Responsibility	Completion date
Coordinate recovery actions	High	YDTFRT and KDTFRT	Ongoing
Monitor populations	High	DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT	Ongoing
Liaise with relevant land managers	High	DEC (Katanning and Yilgarn Districts), through the KDTFRT and YDTFRT	Ongoing
Conduct further surveys	High	DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT	Ongoing
Fence populations	High	DEC (Katanning District) through KDTFRT	2011
Install DRF markers	High	DEC (Katanning and Yilgarn Districts) through the KDTFRT and the YDTFRT	2009
Collect seed and other material to preserve genetic diversity	High	DEC (Katanning and Yilgarn Districts, TFSC), and BGPA through the KDTFRT and YDTFRT	2013
Develop and implement fire and disturbance trials	High	DEC (Science Division, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT, and relevant authorities	2013
Develop and implement a fire management strategy	High	DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT, and relevant authorities.	Develop by 2009 with implementation ongoing
Seek security of tenure	Moderate	DEC (Katanning District) through the KDTFRT	2012
Obtain biological and ecological information	Moderate	DEC (Science Division, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT	2009
Undertake weed control	Moderate	DEC (Katanning and Yilgarn Districts, Science Division) through the KDTFRT and YDTFRT	Ongoing
Map habitat critical to the survival of *Acacia lanuginophylla*	Moderate	DEC (Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT	2009
Promote awareness	Moderate	DEC (Katanning and Yilgarn Districts, SCB and Strategic Development and Corporate Affairs Division) through the KDTFRT and YDTFRT	Ongoing
Review the recovery plan and the need for further recovery actions	Moderate	DEC (SCB, Katanning and Yilgarn Districts) through the KDTFRT and YDTFRT	2013

4. TERM OF PLAN

Western Australia

This IRP will operate from February 2008 to January 2013 but will remain in force until withdrawn or replaced. If the taxon is still ranked VU after five years, the need for further recovery actions and an update of this IRP will be assessed.

Commonwealth

In accordance with the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* this adopted recovery plan will remain in force until revoked.

This recovery plan must be reviewed at intervals of not longer than five years.

5. REFERENCES

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6. TAXONOMIC DESCRIPTION

Excerpt from: Flora of Australia Volume 11B, Mimosaceae, Acacia part 2. Melbourne: ABRS/CSIRO Publishing (2001). pp 32.

Shrub 0.5-1.2 m high, dense to open, domed, erect or spreading. *Branchlets* densely white-woolly. New shoots yellow-green. *Phyllodes* narrowly elliptic to narrowly oblong-oblanceolate, 1.5-4 cm long, 3.5-10 mm wide, grayish green, densely woolly, with 3 main longitudinal nerves and with prominent longitudinally anastomosing secondary nerves in between; *venation* obscured by indumentum; *gland* 2-6mm above pulvinus. *Inflorescences* simple, 1 per axil; *peduncles* 2-4 mm long, woolly; *basal bract* persistent; *heads* globular, 5-7 mm diameter, 30-32 flowered, golden; *bracteoles* stipitate, ovate, short-acuminate, exserted in bud. *Flowers* 5-merous; sepals free. *Pods* oblong, to 2.5 cm long, 6-7 mm wide, thinly crustaceous, densely woolly. *Seeds* elliptic, 3 mm long, tan; *aril* subapical.

Acacia lanuginophylla is closely related to *Acacia cassicula*, but is distinguished by its dense, woolly indumentum.

SUMMARY OF RECOVERY ACTIONS AND COSTS

		Year 1			Year 2			Year 3			Year 4			Year 5	
Recovery action	**DEC**	**Other**	**Ext.**	**DEC**	**Other**	**Ext.**	**DEC**	**Other**	**Ext.**	**DEC**	**Other**	**Ext.**	**DEC**	**Other**	**Ext.**
Coordinate recovery actions	2,000	500	300	2,000	500	300	2,000	500	300	2,000	500	300	2,000	500	300
Monitor populations	1,800		900	1,800		900	1,800		900	1,800		900	1,800		900
Liaise with relevant land managers	1,500		700	1,500		700	1,500		700	1,500		700	1,500		700
Conduct further surveys	1,400		900	800		700	800		700	800		700	800		700
Fence populations							1600	800							
Install DRF markers	200		400												
Collect seed and other material to preserve genetic diversity	2,300		1,400				2,300		1,400				2,300		1,400
Develop and implement fire and disturbance trials	4,100	1,000	1,900				2,500	2,100	1,000				2,500	2,100	1,000
Develop and implement a fire management strategy	3,000	1000	1,500												
Seek security of tenure							1,300		200	1,300		200			
Obtain biological and ecological information				1,500		7,100	1,500		7,100						
Undertake weed control	1,900		1,600	1,900		1,600	1,900		1,600	1,900		1,600	1,900		1,600
Map habitat critical to the survival of *Acacia lanuginophylla*	900		2,100												
Promote awareness	1,000		600				1,000						1,000		
Review the recovery plan and the need for further recovery actions													1,500		
Total	20,100	2,500	12,300	9,500	500	11,300	18,200	3,400	13,900	9,300	500	4,400	15,300	2,600	6,600
Yearly Total	**34,900**			**21,300**			**35,500**			**14,200**			**24,500**		

Ext. = External funding (funding to be sought)

Total DEC: $72,400
Total Other: $9,500
Total External Funding: $48,500
Total Costs: $130,400