

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister approved this conservation advice and included this species in the Endangered category, effective from 11/05/2018.

Conservation Advice

Acacia wilsonii

Wilson's wattle

Summary of assessment

Conservation status

Acacia wilsonii has been found to be eligible for listing in the Endangered category, as outlined in the attached assessment.

Reason for conservation assessment by the Threatened Species Scientific Committee

This advice follows assessment of information provided by Western Australia as part of the Common Assessment Method process, to systematically review species that are inconsistently listed under the EPBC Act and relevant state/territory legislation or lists.

More information on the Common Assessment Method is available at:

<http://www.environment.gov.au/biodiversity/threatened/cam>

The information in this assessment has been compiled by the relevant state/territory government. In adopting this assessment under the EPBC Act, this document forms the Approved Conservation Advice for this species as required under s266B of the EPBC Act.

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 33 business days between 3 October 2017 and 16 November 2017. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

Recovery plan

A recovery plan for this species under the EPBC Act is not recommended, because the Approved Conservation Advice provides sufficient direction to implement priority actions and mitigate against key threats. The relevant state/territory may decide to develop a plan under its equivalent legislation.

Recommendations

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the Endangered category:
Acacia wilsonii
- (ii) The Committee recommends that there not be a recovery plan for this species.

Threatened Species Scientific Committee

28 February 2018

Nomination/Proposal summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	<i>Acacia wilsonii</i>			
Common name:	Wilson's Wattle			
Family name:	Fabaceae	Fauna <input type="checkbox"/>	Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input checked="" type="checkbox"/>	Change of status/criteria <input type="checkbox"/>	Delisting <input type="checkbox"/>	
1. Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally? 2. Is it present in an Australian jurisdiction, but not listed?		Provide details of the occurrence and listing status for each jurisdiction in the following table		
Jurisdiction	State / Territory in which the species occurs	Date listed or assessed (or N/A)	Listing category i.e. critically endangered or 'none'	Listing criteria i.e. B1ab(iii)+2ab(iii)
International (IUCN Red List)				
National (EPBC Act)				
State / Territory	1. WA	2004	Endangered	C2a(i)
		2006 (assessed by TSSC)	Endangered	B1ab(ii,iii,iv)+B2ab(ii,iii,iv); C2a(i); D
		5/4/2017	Endangered	B1ab(iii,v)+B2ab(iii,v); C2a(i)
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> surveys of the species were adequate to inform the assessment; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Further monitoring of the known locations since the 2006 assessment has shown the number of mature individuals have varied from 179 in 2002, to 148 in 2007, to 266 in 2016.			
<ul style="list-style-type: none"> the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment. 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Assessment is consistent, with minor change to the criteria. Since the assessment in 2006, the number of recorded mature individuals has varied, declining from 179 in 2002 to 148 in 2007 for a partial population count, and increasing to 266 in 2016. Individuals in some subpopulations have shown signs of stress with others appearing to be aging with little recruitment observed. Subpopulations occurring on road reserves are also highly threatened by road maintenance with the subsequent loss of associated habitat occurring at Subpopulation 4. Without ongoing			

		management a projected decline is expected, however, no continuing decline in the number of subpopulations is projected. Now meets criteria B1ab(iii,v)+2ab(iii,v); C2a(i).
Nominated national conservation status: category and criteria		
Presumed extinct (EX) <input type="checkbox"/>		Critically endangered (CR) <input type="checkbox"/> Endangered (EN) <input checked="" type="checkbox"/> Vulnerable (VU) <input type="checkbox"/>
None (least concern) <input type="checkbox"/>		Data Deficient <input type="checkbox"/> Conservation Dependent <input type="checkbox"/>
What are the IUCN Red List criteria that support the recommended conservation status category?	EN B1ab(iii,v)+B2ab(iii,v); C2a(i)	
Eligibility against the IUCN Red List criteria (A, B, C, D and E)		
<i>Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For delisting, provide details for why the species no longer meets the requirements of the current conservation status.</i>		
A.	Population size reduction (evidence of decline)	<ul style="list-style-type: none"> The total number of recorded mature individuals appears to fluctuate, declining from 179 in 2002 to 148 in 2007 (this figure is likely to be an underestimate as only partial surveys were undertaken for two subpopulations), but then increasing to 266 in 2016. Unable to assess
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	<ul style="list-style-type: none"> (B1) Using Minimum Convex Polygon (MCP) the EOO is approximately 225 km². (B2) Area of Occupancy is estimated as 16 km² using the 2km x 2km grid method, and the area of mapped subpopulations is 0.01855 km² or 1.855 hectares. (a) Known from four locations which are severely fragmented as the subpopulations occur in habitat which is not contiguous and the surrounding landscape has been largely cleared for agriculture. (b) Continuing decline observed and projected: (ii) The AOO is not projected to change based on the 2km x 2km grid method. (iii) Some evidence of drought stress in several subpopulations with yellowing of leaves observed during surveys in 2007. Subpopulations occurring on road reserves are highly threatened by road maintenance. The subsequent loss of associated habitat which occurred at Subpopulation 4 is likely to have resulted in either loss of plants or capacity for plants to establish. (iv) Historically known from a location 10 km north of Badgingarra in 1965. No plants have been found at this location since and it is thought to be extinct. However, continuing decline in subpopulations not projected. (v) The number of mature individuals recorded has varied with a small increase noted in 2016. However, a decline in the number of mature individuals is projected due to occurrences on road reserves, observed plant stress and aging of individuals. Meets criteria for Endangered B1ab(iii,v)+B2ab(iii,v)

C.	Small population size and decline (population size, distribution and evidence of decline)	<ul style="list-style-type: none"> Known from 266 mature individuals. A decline in mature individuals is projected due to destruction or degradation of roadside vegetation at Subpopulations 1, 2, 4 and 5, and a lack of recruitment in Subpopulation 3. Largest subpopulation contains 91 mature individuals (34% of total number of individuals). Meets Endangered C2(a)(i)
D.	Very small or restricted population (population size)	<ul style="list-style-type: none"> (D) The species is known from 266 mature individuals in total. Meets criteria for Vulnerable D1
E.	Quantitative analysis (statistical probability of extinction)	<ul style="list-style-type: none"> No information to assess.

Summary of assessment information

EOO	225 km ² (MCP)	AOO	16 km ² (2 km x 2 km grid). Extrapolated area of subpopulations 0.01855 km ²	Generation length	Unknown
No. locations	4	Severely fragmented		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> Unknown <input type="checkbox"/>
No. subpopulations	5	No. mature individuals	266		
Percentage global population within Australia			100		
Percentage population decline over 10 years or 3 generations			Unknown		

Threats (detail how the species is being impacted)

Threat <i>(describe the threat and how it impacts on the species. Specify if the threat is past, current or potential)</i>	Extent <i>(give details of impact on whole species or specific subpopulations)</i>	Impact <i>(what is the level of threat to the conservation of the species)</i>
Road maintenance <ul style="list-style-type: none"> Threats include grading, chemical spraying, construction of drainage channels, and slashing of road vegetation. Past, current and future	Subpopulations 1, 2, 4 and 5	Severe
Drought <ul style="list-style-type: none"> Individuals in sub-populations 1, 2 and 5 showed some evidence of drought stress with yellowing of leaves in 2007. Climate change modelling for the south west predicts a decline in rainfall, and some seasonal shift to summer rainfall events, which is likely to increase the potential impact of drought on the 	Whole population	Severe

species. • Equivalent to a major disturbance. Past, current and future		
Rabbits • Grazing impacts on the establishment of seedlings and thereby limiting natural recruitment. • Disturbance to plants and roots from rabbit diggings. Past, current and future	Subpopulation 4	Severe
Altered fire regimes • It is not certain how the species responds to fire but it is likely to be killed by fire and regenerate from seed. If fire frequency is increased the soil seed bank could be depleted before juvenile plants have reached maturity. Past, current and future	Whole population	Severe
Poor recruitment • Individuals at Subpopulation 3 appear to be aging with little to no recruitment recorded. The species is likely to require a disturbance to recruit, but if disturbance is too frequent or is followed by a drought, the population may be impacted. Past, current, future	Whole population	High
Management and Recovery		
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p><i>List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).</i></p> <ul style="list-style-type: none"> • Department of Environment and Conservation (2012) Wilson's Wattle, <i>Acacia wilsonii</i> Interim Recovery Plan 2012–2017. Interim Recovery Plan No. 329. Department of Environment and Conservation, Western Australia. 		
<p><i>List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.</i></p> <ul style="list-style-type: none"> • Monitoring and surveys have been carried out to determine plant numbers and impact of threats; • Markers have been installed on all road reserve subpopulations (1, 2, 4 and 5); • Subpopulation 3 on private property has been fenced to protect remnant vegetation; • Seed was collected in 1999 from Subpopulation 1 and stored at Parks and Wildlife Threatened Flora Seed Centre. 		
<p><i>List further recommended management or research actions, if any, that would benefit the conservation of the species. Please ensure that this section addresses all identified threats.</i></p> <p>Management</p> <ul style="list-style-type: none"> • Monitor subpopulations for evidence of rabbit or weed impacts, or changes in plant or site health; • Liaise with local shire and private landowners to ensure that subpopulations of the species are not 		

accidentally damaged or destroyed, and the habitat is maintained in a suitable condition for the conservation of the species;

- Develop and implement a fire management strategy, including the need for, and method of, the construction and maintenance of firebreak;
- Undertake surveys in areas of potentially suitable habitat;
- Control rabbits through scatter baiting;
- Establish new subpopulations through translocation into secure areas;
- Investigate formal conservation arrangement, management agreement or covenant on private land, and investigate inclusion in reserve tenure if possible.

Research

Research biology and ecology of the species including:

- a study of the soil seed bank dynamics and the role of various factors including disturbance, competition, drought and inundation in recruitment and seedling survival;
- determination of reproductive strategies, phenology and seasonal growth;
- investigation of the mating system and pollination biology;
- investigation of population genetic structure, levels of genetic diversity and minimum viable population size; and
- the impact of changes in hydrology in the habitat.

Nomination prepared by:	
Contact details:	
Date submitted:	28/11/2016
<i>If the nomination has been refereed or reviewed by experts, please provide their names and contact details:</i>	

Summary of subpopulation information (detailed information to be provided in the relevant sections of the form)						
Location or Subpopulation (include coordinates)	Land tenure	Survey information: Date of survey and No. mature individuals	Area of Subpopulation	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
Subpopulation 1: east of Eneabba.	Shire road reserve	1996: 24 2002: 12 2007: 98 2016: 86 [3 dead]	0.77 ha	Healthy. Previously showing some evidence of drought stress with yellowing of leaves.	Road maintenance (past, present, future) Fire (past, present, future) Poor recruitment (past, present, future) Drought (past, present, future)	Install markers Develop a fire management plan Collect seed and test viability, conduct regeneration trials Conduct further surveys Liaise with local shire Establish new populations through translocation
Subpopulation 2: east of Warradarge.	National Park and shire road reserve	2002: 115 2007: 38 (only plants on road counted) 2016: 91	0.326 ha	Healthy. Previously showing some evidence of drought stress with yellowing of leaves.	Road maintenance (past, present, future) Fire (past, present, future) Poor recruitment (past, present, future) Drought (past, present, future)	Install markers Develop a fire management plan Collect seed and test viability, conduct regeneration trials Liaise with landowners and local shire Conduct further surveys Establish new populations through translocation
Subpopulation 3: Warradarge.	Private property	2000: <5 2007: 8 2016: 37	0.43 ha	Moderate. Plants appear old and little recruitment occurring.	Poor recruitment (past, present, future) Fire (past, present, future) Drought (past, present, future)	Develop a fire management plan Liaise with landowners Collect seed and test viability,

						<p>conduct regeneration trials</p> <p>Conduct further surveys</p> <p>Establish new populations through translocation</p> <p>Improve security through conservation covenants</p>
Subpopulation 4: SE of Warradarge.	Shire road reserve	<p>2002: 1</p> <p>2010: 0</p> <p>2013: 0</p> <p>2016: 42 [3 dead]</p>	0.306 ha	<p>Currently healthy. Previously in poor condition. Single plant destroyed by wildfire in 2009. In 2013 area then cleared for replacement of boundary fence.</p>	<p>Road and fence maintenance (past, present, future)</p> <p>Fire (past, present, future)</p> <p>Rabbits (past, present, future)</p> <p>Poor recruitment (past, present, future)</p> <p>Drought (past, present, future)</p>	<p>Install markers</p> <p>Liaise with local shire</p> <p>Develop a fire management plan</p> <p>Undertake baiting for rabbits</p> <p>Collect seed and test viability, conduct regeneration trials</p> <p>Conduct further surveys</p> <p>Establish new populations through translocation</p>
Subpopulation 5: east of Warradarge.	Shire road reserve	<p>2002: 46</p> <p>2007: 4 (only partial survey undertaken)</p> <p>2016: 10</p>	0.023 ha	<p>Healthy. Previously showing some evidence of drought stress with yellowing of leaves.</p>	<p>Road maintenance (past, present, future)</p> <p>Fire (past, present, future)</p> <p>Poor recruitment (past, present, future)</p> <p>Drought (past, present, future)</p>	<p>Install markers</p> <p>Liaise with local shire</p> <p>Develop a fire management plan</p> <p>Collect seed and test viability, conduct regeneration trials</p> <p>Conduct further surveys</p> <p>Establish new populations through translocation</p>



Species Information Sheet

Important notes:

- For all facts and all information presented – identify your references/information sources, document reasons and supportive data. Indicate the quality of facts/information, for example was it based on research or anecdotal data; on observed data or estimated or inferred from data; or suspected to be the case.
- Personal communications - Identify data/opinions based on personal communications (including your own). These need to be supported by permission slips (available from the Department) so that opinions can be cited on the Department’s website if needed.
- Confidential material – Identify confidential material and explain the sensitivity.
- Tables – Can be included at the end of this document or prepared as separate electronic documents. Refer to tables in the relevant area of the text.
- Species - applies to the entity nominated under the Act, either species and subspecies
- Population – refers to populations within a species or total population numbers for a species.
- Cross-reference relevant areas of the data sheet where needed.
- Definitions – SPRAT – The Department’s Species Profiles and Threats database; EPBC – Environment Protection and Biodiversity Conservation Act. If more guidance on definitions is needed, see IUCN Guidelines at <http://www.iucn.org/themes/ssc/redlists/RedListGuidelines.pdf>

Section 1 – Conservation Assessment

Information required for assessing species nominated as threatened under the EPBC Act. Answer all parts, in the table cell below the question, indicating when there is no information available.

Taxonomy
<p>1. <i>What are the currently accepted scientific and common name/s for the species? Note any other scientific names that have been recently used.</i></p> <p><i>Acacia wilsonii</i> R.S.Cowan & Maslin (1999)</p> <p>Wilson’s wattle.</p>
<p>2. <i>Is this species conventionally accepted? If not, explain why. Is there any controversy on the taxonomy?</i></p> <p>Yes.</p>
<p>3. <i>Describe any cross-breeding with other species in the wild, indicating how frequently and where this occurs</i></p> <p>None recorded.</p>

Legal status

4. *What is the species' current conservation status under Australian and State/Territory Government legislation?*

Acacia wilsonii was proposed for listing in Western Australia under the *Wildlife Conservation Act 1950* as Declared Rare Flora in 2003, and was considered at the March 2003 meeting. It was previously listed as Priority 2, but was considered to be appropriate for the IUCN category Endangered C2a(i) due to the small number of mature individuals known (<180); and known populations not adequately reserved with the majority located on road reserves and under threat from road maintenance.

In March 2006, the species was reassessed as Endangered B1ab(ii,iii,iv)+B2ab(ii,iii,iv);C2a(i);D due to its restricted geographic range, decline in AOO, quality of habitat and number of populations; and small number of individuals known (<250).

Further survey was undertaken from 2007 to 2016, and the total number of individuals increased to 266 (no longer meets EN:D). However, individuals in some subpopulations showed signs of stress, and others appeared to be aging with little recruitment observed. Subpopulations occurring on road reserves are highly threatened by road maintenance and without ongoing management, a projected decline in the number of individuals is expected. Currently meets criteria B1ab(iii,v)+B2ab(iii,v); C2a(i).

It is not currently listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth).

Description

5. *Give a brief description of the species': appearance, including size and/or weight, and sex and age variation if appropriate; social structure and dispersion (e.g. solitary/clumped/flocks)*

A prostrate shrub, normally 0.2–0.3 m tall, to c. 0.3 m wide, the branches spreading horizontally. Branchlets at first slightly angled, densely villous to pubescent with minute black resin hairs intermixed, soon terete and glabrous except resin hairs sometimes persistent. Stipules triangular, acuminate, 1.5–3 mm long, persistent. Phyllodes sessile, continuous on branchlets and not easily detached from them, terete to subterete, 6.5–22.5 cm long, 1–1.5 mm diam., coriaceous to semi-rigid, ascending to erect, shallowly incurved to shallowly sigmoid or sinuous, glabrous, green (ageing yellow-green), stomata evident at x10 mag.; apex acute, commonly slightly curved to uncinata, innocuous; longitudinal nerves 8, strongly raised when dry (nerves separated by well-defined, longitudinal furrows). Gland absent. Inflorescences simple, 1 or 2 per axil; peduncles 4–10 mm long, sometimes to 14 mm long in fruit, densely villous and with minute resin hairs intermixed; basal peduncular bract lanceolate, 2.5 mm long, persistent. Heads globular, golden, 8 mm diam., densely 24–37-flowered; bracteoles exerted in young bud. Flowers 5-merous; sepals 1/2–3/4 as long as petals, narrowly elliptic, 1/2–3/4 -united, ciliolate; petals 1/2-united, elliptic, glabrous. Pods linear, subterete, not constricted between seeds, 3–5.5 cm long, 3–3.5 mm wide, thinly crustaceous, slightly curved, dotted with minute, black resin hairs, greenish grey with yellowish, non-thickened margins. Seeds longitudinal, obloid, 2–3 mm long, 1.5 mm wide, 1.5 mm thick, dull, brown, tuberculate, tubercles irregular in form, the areole area smooth, paler, sometimes raised; pleurogram U-shaped to nearly semicircular; aril terminal, yellow, scalloped (Cowan and Maslin 1999).

6. *Identify major studies on the species*

Cowan and Maslin described the species in 1999.

International background (for species that are distributed both inside and outside Australia's jurisdiction)

7. *Describe the species' global distribution*

N/A

8. *Give an overview of the global population's size, trends, threats and security of the species outside Australia*

N/A

9. *Explain the relationship between the Australian population and the global population, including:*

- What percentage of the global population occurs in Australia;*
- Is the Australian population distinct, geographically separate or does part or all of the population move in/out of Australia's jurisdiction (give an overview; details in Movements section);*
- Do global threats affect the Australian population?*

N/A

National context

Distribution

10. Describe the species' distribution in Australia and, if available, attach a map

Acacia wilsonii occurs between Eneabba and Badgingarra, (a distance of about 50km), in the south west of Western Australia. It occurs in the Northern Agricultural NRM (Cowan and Maslin 1999; DEC 2006) (See Attachment A).

11. What is the extent of occurrence (in km²) for the species (described in Attachment A); explain how it was calculated and datasets used

- What is the current extent of occurrence?
- What data is there to indicate past declines in extent of occurrence (if available, include data that indicates the percentage decline over the past 10 years or 3 generations whichever is longer)?
- What data is there to indicate future changes in extent of occurrence (if available, include data that indicates the percentage decline over 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future) where the time period is a continuous period that may include a component of the past)?

The extent of occurrence in 2016 is estimated to be approximately 225km² (based on the minimum convex polygon encompassing the subpopulations).

There is some data to suggest a historic decline in the extent of occurrence. The original plants found in 1965, 10km north of Badgingarra, have not been relocated. This indicates a decrease in EOO by approximately 10km. A future decline in the EOO is not projected.

12. What is the area of occupancy (in km²) for the species (described in Attachment A; explain how calculated and datasets that are used)

- What is the current area of occupancy?
- What data is there to indicate past declines in area of occupancy (if available, include data that indicates the percentage decline over the past 10 years or 3 generations whichever is longer)?
- What data is there to indicate future changes in area of occupancy (if available, include data that indicates the percentage decline over 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future) where the time period is a continuous period that may include a component of the past)?

In 2002, there was insufficient data to calculate the actual area of occupancy, as not all subpopulations had area recorded – refer to section 1.17. Based on extrapolations of the data available the combined area of the known subpopulations was estimated to be approximately 0.008km². In 2016 the mapped area of subpopulations was 0.01855km² or 1.855 hectares.

Estimated AOO is 16 km² using the 2km x 2km grid method. The AOO is not projected to change based on the 2km x 2km grid method.

13. Is the species' distribution severely fragmented? Why?

Severely fragmented refers to the situation in which increased extinction risk to the taxon results from most individuals being found in small and relatively isolated subpopulations (in certain circumstances this may be inferred from habitat information). These small subpopulations may go extinct, with a reduced probability of recolonization.

Yes, this species is found only in 5 subpopulations which are not in contiguous habitat. The surrounding landscape has been largely cleared for agriculture (DEC 2006).

14. How many locations do you consider the species occurs in and why?

The term '**location**' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the species present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a species is affected by more than one threatening event, location should be defined by considering the most serious plausible threat.

Acacia wilsonii occurs at 4 locations (5 subpopulations) which are severely fragmented as the subpopulations occur in habitat which is not contiguous and the surrounding landscape has been largely cleared for agriculture.

Habitat

15. Give a brief description of the species' habitat/s (Details entered in Section 2)

Acacia wilsonii occurs on white/yellow sand and lateritic gravel, sandy clay over laterite (WA Herbarium 2006) or grey sand in heath (Cowan and Maslin 1999).

Populations

16. *What is the species' total population size in terms of number of mature individuals? Are there other useful measures of population size and what are they?*

In the absence of figures, terms such as common, abundant, scarce can be of value.

The total population size for this species in 2002 was estimated to be 174 mature plants across 5 subpopulations (DEC 2006). Note – this figure does not include the estimate of <5 plants found at Subpopulation 3.

In 2016, the total population size recorded was 266 mature individuals across 5 subpopulations.

17. *Does the species occur in a number of smaller populations? How many? If available, for each population give the locality, numbers and trends in numbers and tenure of land (if available) (include extinct populations). Can these be considered to be subpopulations and why?*

Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less).

This species is known from 5 subpopulations which occur on Shire Road Reserves, National Park and private property.

Confidential:

Sub-population	Location	Land Tenure	Date Last Surveyed	Number of Plants	Area of occupancy (m2)
1	East of Eneabba.	Shire Road Reserve	27/03/2002 2016	12 86 [3 dead]	5000 7,700
2a	East of Warradarge.	National Park	20/11/2002 2016	31 23	50 *
2b	East of Warradarge.	Shire Road Reserve	20/11/2002 2016	64 40	Not recorded *
2c	East of Warradarge.	Shire Road Reserve	20/11/2002 2016	20 28	100 *3,260 (*for a,b,c)
3	Warradarge. Track along east side of main valley.	Private property	01/05/2000 2016	<5 37	Not recorded 4,300
4	SE of Warradarge, at hill summit, plant in front of a mallee on fenceline.	Shire Road Reserve	21/11/2002 2016	1 42 [3 dead]	Not recorded 3,060
5	East of Warradarge.	Shire Road Reserve	20/11/2002 2016	46 10	Not recorded 230
	Holotype collected from 10km north of Badginagarra.	Unknown	09/12/1992	Not recorded	Not recorded

(DEC 2006)

18. *What is the population trend for the entire species?*

a. *What data is there to indicate past decline in size (if available, include data on rate of decline over past 10 years or 3 generations whichever is longer)?*

b. *What data is there to indicate future changes in size (if available, include data which will indicate the percentage of decline over 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future) where the time period is a continuous period that may include a component of the past)?*

TRENDS IN POPULATION SIZE & RANGE:

Subpopulation	Survey History	Number of Plants Recorded
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1	24/09/1976 03/12/1992 19/08/1993 17/05/1996 28/10/1996 26/10/2001 27/03/2002 13/09/2002 17/11/2002 10/12/2002 13/03/2007 2016	Collection only Perhaps 20? 2 24 24 8 (not fully surveyed) 12 Not fully surveyed Not fully surveyed 98 86
2a	24/10/1982 03/11/1996 05/1996 11/12/1996 20/11/2002 2016	Collection only 5 5 5 31 23
2b	03/11/1996 11/12/1996 20/11/2002 2016	Not recorded Not recorded 64 40
2c	03/11/1996 11/12/1996 20/11/2002 13/03/2007 2016	Not recorded 20 20 38 28
3	01/05/2000 22/02/2007 2016	<5 8 37
4	21/11/2002 09/01/2010 2013 2016	1 0 0 42
5	20/11/2002 2016	46 10
Holotype	02/11/1965 06/08/1992 09/12/1992	Not recorded Not found Not found

(DEC 2006; 2016).

The original location for this species (10km north of Badgingarra) has not been relocated.

Surveys at Subpopulations 1, 2 and 5 in 2007 noted that plants appeared to be in poor condition with yellowing of leaves observed, likely resulting from drought stress.

Subpopulation 2a occurs within a National Park and is in good condition.

Subpopulation 3 occurs on private property which has been fenced and was in good condition in 2000. In 2016, the subpopulation appeared old with little recruitment evident.

Subpopulation 4, located on a road reserve, was burnt in a wildfire in 2009 and then its habitat cleared for new fenceline construction in 2013. No plants were located at the site for a number of years. In 2016, the subpopulation was recorded as healthy with 42 individuals present.

19. *Does the species undergo extreme natural fluctuations in population numbers, extent of occurrence or area of occupancy? To what extent and why?*

Extreme fluctuations can be said to occur in a number of taxa when population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e. a tenfold increase or decrease).

The total number of recorded mature individuals has fluctuated, declining from 179 in 2002 to 148 in 2007, and then increasing to 266 in 2016. However this fluctuation is likely a result of survey methods. It is probable however that the species will recruit following a disturbance.

20. *What is the generation length and how it is calculated?*

Generation length is the average age of parents of the current cohort (i.e. newborn individuals in the population). Generation length therefore reflects the turnover rate of breeding individuals in a population. Generation length is greater than the age at first breeding and less than the age of the oldest breeding individual, except in taxa that breed only once. Where generation length varies under threat, the more natural, i.e. pre-disturbance, generation length should be used.

Unknown.

Survey effort

21. *Has the species been reasonably well surveyed? Provide an overview of surveys to date and the likelihood of its current known distribution and/or population size being its actual distribution and/or population size*

Diana Papenfus searched for this species during her 1996 surveys (no time known).

Rebecca Wolstenholm (ex-Conservation officer, Moora) surveyed in December 1996.

Staff from the WA Herbarium undertook extensive surveys of surrounding suitable habitat in the Moora and Geraldton Districts in June-July Oct 2001, March 2002 (0.5 days), and November – December 2002 (3.8 days).

General surveys undertaken during the preparation of the Moora District Rare Flora Wildlife Management Program did not discover any new populations of this species.

An area 10km north of Badginagarra where a specimen was collected in 1965 was searched by Cranfield and Spencer on 9/12/1992, by Patrick and Brown on 6/8/1992 and again in November 2002. All were unsuccessful in re-locating the species although suitable habitat was found (refer to table in section 1.18 for survey dates) (DEC 2006).

Further surveys in 2007, 2010 and 2016 by Department of Parks and Wildlife staff.

Threats

22. *Identify past, current and future threats, to the species indicating whether they are actual or potential. For each threat, describe:*

- a. *how and where it impacts on this species*
- b. *what its effect has been so far (indicate whether it is known or suspected; present supporting information/research; does it only affect certain populations)*
- c. *what is its expected effect in the future (is there supporting research/information; is the threat only suspected; does it only affect certain populations)*

There is some risk of damage and/or destruction of plants to Subpopulations 1, 2, 4 and 5 from road maintenance. Threats include grading, construction of drainage channels and the mowing of roadside vegetation. Several of these actions also encourage weed invasion.

Acacia wilsonii appears to be killed by fire and regenerate from seed. However, if fire frequency is increased the soil seed bank could be depleted before juvenile plants have reached maturity. A reduction of natural fire and disturbance in the habitat of the species will more likely however, negatively influence reproduction.

23. *If not included above, identify catastrophic threats, i.e. threats with a low predictability that are likely to severely affect the species - Identify the threat, explain its likely impact and indicate the likelihood of it occurring (e.g. a drought/cyclone in the area every 100 years)*

Unknown.

24. *Identify and explain any additional biological characteristics particular to the species that are threatening to its survival (e.g. low genetic diversity)? Identify and explain any models addressing survival of the species.*

N/a

Threat abatement and recovery

25. *Identify key management documentation available for the species, e.g. recovery plans, conservation plans, threat abatement plans.*

Patrick, S.J., and Brown, A.P. (2001) Declared Rare and Poorly Known Flora in the Moora District. Department of Conservation and Land Management, Perth, Western Australia.

Department of Environment and Conservation (2012) Wilson's Wattle, *Acacia wilsonii* Interim Recovery Plan 2012–2017. Interim Recovery Plan No. 329. Department of Environment and Conservation, Western Australia.

26. Give an overview of how threats are being abated/could be abated and other recovery actions underway/proposed. Identify who is undertaking these activities and how successful the activities have been to date

- GPS all individuals and undertake regular monitoring.
The species is monitored opportunistically by Parks and Wildlife.
- Install road markers at subpopulations on road verges.
Declared Rare Flora (DRF) markers have been installed at these subpopulations. These alert people to the presence of the species and the need to avoid work that may damage it or its habitat.
- Collect seed for long term storage.
2,398 seeds collected from *Acacia wilsonii* from Population 1 and Subpopulation 2a, are stored in Threatened Flora Seed Centre (TFSC) at -18°C . The seed has been processed and the germination rates were 60 and 80%.
- Re-survey population on private property.
Subpopulation 3 was fully surveyed in 2007 and 2016. The subpopulation appears to be aging with little recruitment occurring. This subpopulation was fenced to protect the native vegetation.
- Promote awareness of species
An information sheet, which includes a description of the plant, its habitat type, threats, management actions and photos has been produced for the species.

27. Which populations are in reserve systems? Which of these are actively managed for this species? Give details

Subpopulation 2a occurs in a National Park.
Subpopulations 1, 2b, 2c, 3 and 4 occur on Shire Road reserve.
Subpopulation 5 occurs on private property.

Section 2 – Recovery, Conservation, Protection

Additional information on legal status

1. Does the species have specific protection (e.g. listed on an annex or appendix) under other legislation or intergovernmental arrangements, e.g. Convention on International Trade in Endangered Fauna and Flora (CITES), Convention on Migratory Species (CMS)

Listed in Western Australia under the Wildlife Conservation Act 1950 (WA) as Rare.

Additional information on distribution

2. Give locations of: captive/propagated populations; populations recently re-introduced to the wild; and sites for proposed population re-introductions. Note if these sites have been identified in recovery plans

There are no translocated populations of this species.

Additional information on habitat

3. Describe the species' non-biological habitat (e.g. aspect, topography, substrate, climate) and biological habitat (e.g. forest type, associated species, sympatric species). If the species uses different habitats for different activities (e.g. breeding, feeding, roosting, dispersing, basking), then describe each habitat

Acacia wilsonii grows on hills or slopes on grey, pale yellow-brown or pinkish sandy clay or loamy sand over a reddish pink laterite. At three subpopulations it grows in mallee woodland (*Eucalyptus eudesmoides*). At all subpopulations it grows in areas of open heath (DEC 2006). At Subpopulation 3 it grows in open tree mallee over dense thicket with *Eucalyptus gittinsii*, *Eucalyptus accedens*, *Melaleuca urceolaris* on the lower slopes of a valley, on dry bare, brown, gravelly/loamy sand (WA Herbarium 2006).

Patrick and Brown (2001) state that it grows in white or yellow sand with lateritic gravel in low heath on the shoulder of lateritic upland. Associated species include *Hakea spathulata*, *Gastrolobium spinosum*, *Allocasuarina campestris* and *Calothamnus quadrifidus*.

4. Does the species use refuge habitat, e.g. in times of fire, drought or flood? Describe this habitat

N/A

5. Is the species part of, or does it rely on, a listed threatened ecological community? Is it associated with any other listed threatened species?

Acacia wilsonii is found with *Spirogardnera rubescens* (DRF) and with *Banksia serratuloides* subsp. *perissa* (DRF) at three subpopulations (2,a,b and c, 4 and 5) (DEC 2006).

Additional information on population

6. Provide details on ages of sexual maturity, life expectancy and natural mortality

This species appears to flower mainly from October to mid November, but also in early December and in March. Mature pods have been found in late September, late October and early November, and also in May. Possibly the irregular flowering times are associated with rainfall events. It is also possible that the plants flower twice a year, as plants were in early bud and some had immature fruit (at Subpopulation 1) on 26 October 2001. In 2002, plants were flowering in mid November but were beginning to dry off by 10 December (DEC 2006).

Acacia wilsonii is a member of the Mimosaceae family and is likely to have a similar biology and ecology to other *Acacia* species. Germination is likely to be triggered by natural disturbance events (physical or fire), hence its affinity for growing in disturbed areas. *Acacia* seeds often have a hard seed coat and remain dormant until the seed coat is ruptured by heating or scarifying. This is a method exploited by many Australian species of *Acacia* to survive the fires that were a regular natural occurrence in many Australian habitats. This was evident at Subpopulation 2a, which was burnt in 1995. The number of plants increased from five in 1996 to 31 in 2002.

7. Identify important populations necessary for the species' long-term survival and recovery? This may include: key breeding populations, those near the edge of the species' range or those needed to maintain genetic diversity

All 5 subpopulations are important for the survival of this species (DEC 2006).

Survey methods

8. Describe methods for detecting species including when to conduct surveys (e.g. season, time of day, weather conditions); length, intensity and pattern of search effort; and limitations and expert acceptance; recommended methods; survey-effort guide

Identification of this species is easier when the plants are in flower from October to March. Any additional survey should be focused on the known subpopulations and remnant vegetation in similar soil and vegetation types (DEC 2006).

9. Give details of the distinctiveness and detectability of the species

Acacia wilsonii is inconspicuous even when in flower (DEC 2006).

Reproduction

10 For plants: When does the species flower and set fruit? What conditions are needed for this? What is the pollinating mechanism? If the species is capable of vegetative reproduction, a description of how this occurs, the conditions needed and when. Does the species require a disturbance regime (e.g. fire, cleared ground) in order to reproduce?

For animals: provide overview of breeding system and of breeding success, including: when does it breed; what conditions are needed for breeding; are there any breeding behaviours that may make it vulnerable to a threatening process?

Cowan and Maslin (1999) note that flowering has been recorded from September to November with mature pods also collected from September to October, with both flower buds and mature pods present on most specimens.

Subpopulation 2a was burnt in 1995. Only 5 plants were found there in 1996, while the number recorded in 2002 was 31. In contrast, Subpopulation 1 (on the road verge) appeared to be declining. Plants at Subpopulation 2b were most common downslope from disturbed earth where the road had been widened. Subpopulation 3 grows close to a track. This indicates that disturbance may play a part in the life history of the species (DEC 2006).

Feeding

11. Summarize the species' food items or sources and timing/seasonality

N/a

12. Briefly describe the species' feeding behaviours, including those that may make the species vulnerable to a threatening process

N/a

Movements

13. Describe any relevant daily and seasonal pattern of movement for the species, including relevant arrival/departure dates if migratory

N/a

14. Give details of the species' home ranges/territories

N/a

Other

15. Is there other information that relates to the survival of this species that you would like to address?

No.

Section 3 – References, compilers, referees

Compulsory to fill in.

Reference list

1. References

Cowan, R.S. and Maslin, B.R. (1999) *Acacia* miscellany 17. *Nuytsia* 12(3):449–452.

DEC (2006) Records held in DEC's Declared Flora Database and rare flora files. WA Department of

Environment and Conservation.

Department of Environment and Conservation (2012) Wilson's Wattle, *Acacia wilsonii* Interim Recovery Plan 2012–2017. Interim Recovery Plan No. 329. Department of Environment and Conservation, Western Australia.

IUCN (2001) *IUCN Red List Categories: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

Patrick, S.J., and Brown, A.P. (2001) Declared Rare and Poorly Known Flora in the Moora District. Department of Conservation and Land Management, Perth, Western Australia.

Western Australian Herbarium (1998–) *FloraBase – The Western Australian Flora*. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/>

Signature block

2. Compiler's name/s

Updated 2016

3. Organisation/s

I understand that material in this template may be used on the Department's website in the Species Profile and Threats Database (SPRAT) and in listing advice for entities assessed under the threatened species provisions of the *Environment Protection and Biodiversity Conservation Act*.

Signed:

4. Date signed

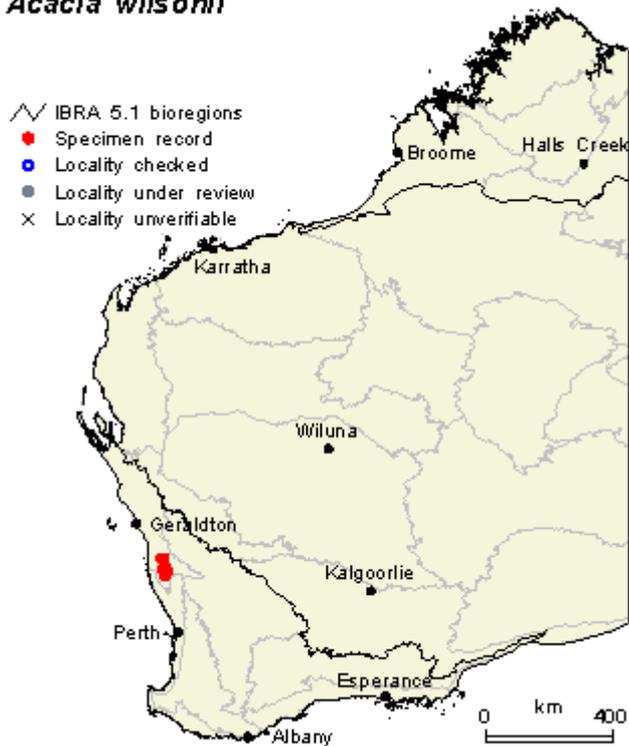
5. Has this document been refereed? If so, indicate by whom.

Provide copies of key documentation/references

AG DEH use only

Attachment A – Species Distribution map

Acacia wilsonii



Mapping by Paul Gioia. Image used with the permission of the Western Australian Herbarium, DEC (<http://florabase.calm.wa.gov.au.au/help/copyright>). Accessed on Wednesday November 29th 2006.