National Recovery Plan for Phantom Wattle *Acacia phasmoides*

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Australian Government

NSW GOVERNMENT Environment, Climate Change & Water

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TABLE OF CONTENTS

Summary

The Phantom Wattle *Acacia phasmoides* is a small to medium-sized shrub that is endemic to a small area of south eastern Australia, where it occurs in both Victoria and New South Wales. Only five populations (four in Victoria and one in NSW) containing about 405 plants are known. There has been a substantial decline in the number of plants in Victoria over the least 20 years. Precise causes of this decline are not known, but may be related to extended drought conditions in the area. Plants may also be being browsed by feral mammals including goats and deer. The Phantom Wattle is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. This national Recovery Plan for the Phantom Wattle is the first recovery plan for the species, and details its distribution, habitat, threats and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Species description

The Phantom Wattle *Acacia phasmoides* (family Mimosaceae) is a small to medium-sized, open and normally erect shrub growing to 1–4 m in height. The stems are silvery-grey, the branches are slender and have scattered, appressed, short, straight and silvery hairs. The phyllodes are alternate, entire, sessile, flat, often curved, narrowly linear, 5–11 cm long and 1–2 mm wide, with a distinct mid-vein. The surface is generally smooth although there are minute papillae on the margins and midrib. Flowers are light golden yellow and arranged in heads, with two per axil, obloid to globular, 0.5–1 cm long and sessile, the rachis densely hairy. The seed pods are up to 9 cm long and 3–5 mm wide, thinly coriaceous, curved to sigmoid, longitudinally veined, with scattered, appressed white hairs when young but hairless at maturity (description from Walsh & Entwisle 1996). The Phantom Wattle is a distinctive wattle, with the combination of very narrow phyllodes more than 4 cm long and the obloid to globular inflorescence readily distinguishing the species.

Distribution and Populations

The Phantom Wattle is restricted to a small area of north-eastern Victoria and south-eastern New South Wales (Figure 1), in the NSW South Western Slopes IBRA Bioregion (*sensu* DEH 2000). In New South Wales, there is a single population of about 320 plants east of Holbrook, with most of the plants occurring in Woomargama National Park and a few plants growing on adjoining private property (J. Briggs DECCW pers. comm. 2008). In Victoria, there are four populations with a total of about 85 plants, (the largest containing about 65 plants, the other three 5–10 plants) all in the Burrowa-Pine Mountain National Park near Corryong. Total area of occupancy for all populations is small, less than 10 ha. Maps showing the general distribution of *A. phasmoides* are available from the Department of Sustainability and Environment (DSE, for Vic) and the Department of Environment, Climate Change and Water (DECCW, for NSW).

Habitat

In New South Wales the Phantom Wattle occurs on seasonally damp granite-derived soils in close proximity to an ephemeral creek and its tributaries (Harden 1991; J. Briggs DECCW pers. comm. 2008), from 220–390 m altitude. There it occurs in woodland dominated by Apple Box *Eucalyptus bridgesiana* and Black Cypress-pine *Callitris endlicheri* with a shrubby understorey of Burgan *Kunzea ericoides*, River Bottlebrush *Callistemon sieberi*, Crimson Bottlebrush *C. citrinus*, Common Fringe-myrtle *Calytrix tetragona*, tea-tree *Leptospermum* spp., Mountain Correa *Correa lawrenceana*, Box-leaved Bossiaea *Bossiaea buxifolia*, Sticky Hop-bush *Dodonaea viscosa*, Varnish Wattle *Acacia verniciflua* and the occasional occurrence of Lemon Bottlebrush *Callistemon pallidus* (J. Briggs DECCW pers. comm. 2008).

In Victoria, Phantom Wattle grows in woodland above 600 m altitude on granitic slopes in sheltered areas, where it grows in cracks between rocks where soil cover is sparse and annual rainfall is between 700–1000 mm. Overstorey species include stunted Red Stringybark *Eucalyptus macrorhyncha*, Broad-leaved Peppermint *E. dives* and Black Cypress-pine, with an

understorey of Burgan, Green Grevillea *Grevillea jephcottii* and Broad-leaf Hop-bush *Dodonaea rhombifolia*. (Walsh & Entwistle 1996; DSE unpubl. data).

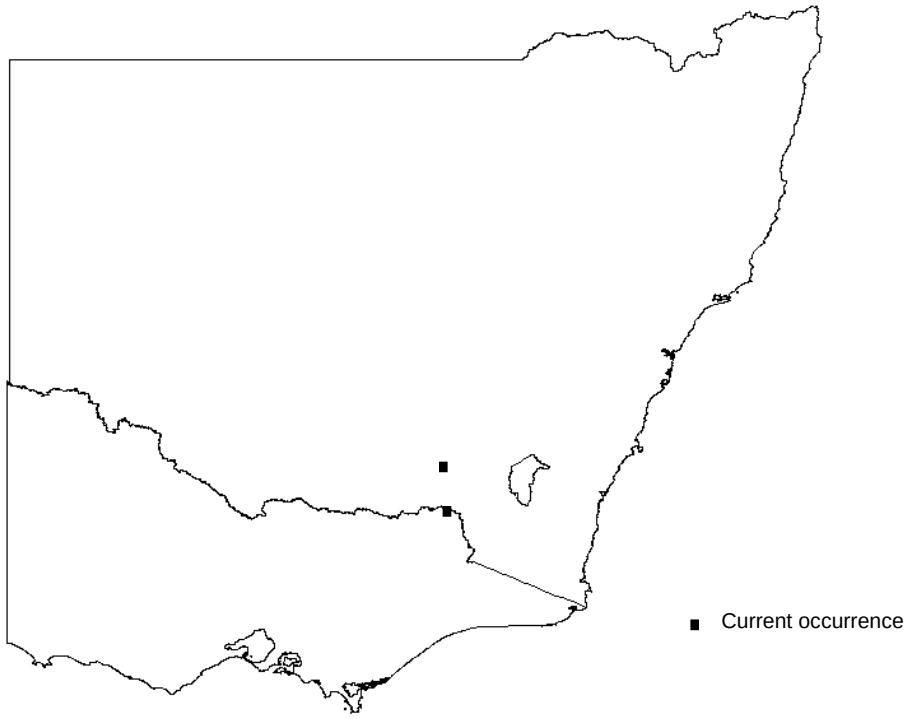

Figure 1 Distribution of Phantom Wattle

Decline and Threats

The Phantom Wattle is known only from the two areas in which it currently occurs, and there are no records to suggest there has been any decline in distribution since European settlement of Australia. Nothing is known of the previous abundance of the NSW population. However, there appears to have been a substantial decline in abundance of Victorian populations, with numbers declining from 175 plants in 1988 to about 85 in 2006. Precise causes of this decline are not certain. The Phantom Wattle tends to grow in damp and sheltered situations, and recent extended drought conditions may be responsible for the decline, with a number of dead and dying plants observed in the Victorian populations. Browsing may also be a problem, with feral goats, pigs, rabbits and deer present in the area where the species occurs. The few plants in the NSW population that grow on private land are affected by invasion of annual grasses.

Given its apparent preference for seasonally damp situations, climate change may pose a substantial threat to the Phantom Wattle, through increased drying of sites. The effect of fire on germination from seed and the longevity of the soil seed bank are not known. Plants in NSW were observed in 2000 to be vigorously suckering from rootstocks following some die-back due to dry conditions (J. Briggs, pers. comm.) and it seems likely that the species would have the ability to resprout from rootstock following a fire event.

Recovery Information

Recovery Objectives

The overall objective of recovery is to minimise the probability of extinction of Phantom Wattle in the wild and to increase the probability of all populations remaining self-sustaining in the long

term. Within the 5-year span of this Recovery Plan, the specific objectives of recovery for Phantom Wattle are to:

1. Determine distribution, abundance and population structure
2. Determine habitat requirements
3. Provide additional legal protection for plants and their habitat
4. Manage threats to populations
5. Identify key biological characteristics
6. Determine growth rates and viability of populations
7. Establish plants in cultivation
8. Build community support for conservation of the species

Program Implementation and Evaluation

This Recovery Plan guides recovery actions for the Phantom Wattle and will be implemented and managed by the Department of Sustainability and Environment (for Vic) and the Department of Environment, Climate Change and Water (for NSW), who will maintain liaison with each other over implementation. The Recovery Plan will run for five years from the date of its adoption under the EPBC Act, and will be reviewed and revised within five years of the date of its adoption.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific Objective 1: Determine distribution, abundance and population structure		
1.1	Undertake surveys to determine the area and extent of populations, the number, size and structure of populations, and inference or estimation of population change. **Responsibility: DSE, PV, DECCW**	• All population re-surveyed for size, condition and habitat.
Specific Objective 2: Determine habitat requirements		
2.1	Survey known habitat in Victoria and collect floristic and environmental information relevant to community ecology and condition. **Responsibility: DSE, PV**	• Habitat critical to survival mapped for all extant populations in Vic.
2.2	Identify and survey potential habitat in Victoria, using ecological and bioclimatic information that may indicate habitat preference. **Responsibility: DSE, PV**	• Predictive model for potential habitat developed & tested at two sites.
Specific Objective 3: Provide legal protection for plants and their habitat		
3.1	Protect plants on private land adjoining Woomargama NP. **Responsibility: DECCW**	• Conservation management agreement established with private landowner to protect plants.
Specific Objective 4: Manage threats to populations		
4.1	Monitor and control threats from pest plants. **Responsibility: DECCW**	• Detect weed species that are posing a serious threat to *A. phasmoides*. • Undertake control measures if required.
4.2	Monitor and control threats from pest animals. **Responsibility: PV, DECCW**	• Continue feral animal control programs in parks.
Specific Objective 5: Identify key biological characteristics		
5.1	Evaluate current reproductive status, seed bank status, longevity, fecundity and recruitment levels. **Responsibility: DSE**	• Reproductive ecology and regenerative potential quantified for four representative sites. • Seed bank potential quantified for all sites.

5.2	Identify key stimuli for seed germination requirements. **Responsibility: DSE**	• Stimuli for recruitment identified. • Management strategies identified to maintain, enhance or restore processes fundamental to reproduction and survival.
5.3	Identify optimal disturbance regimes to maintain habitat. **Responsibility: DSE**	• Preparation and implementation of management prescriptions for Burrowa-Pine Mountain NP populations.
Specific Objective 6: Determine the growth rates and viability of populations		
6.1	Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data. **Responsibility: DSE**	• Techniques for monitoring developed and implemented. • Population growth rates determined and Population Viability Analysis completed for all populations.
Specific Objective 7: Establish a population in cultivation		
7.1	Establish plants in cultivation to provide a research population and potentially for reintroductions. **Responsibility: RBG-M, RBG-S**	• Development of effective propagation and cultivation techniques. • At least 200 mature plants from seed collected from all wild populations in cultivation.
7.2	Establish a seed bank and determine seed viability. **Responsibility: RBG-M, RBG-S**	• Seed from at least 10 plants in each population in long-term storage.
Specific Objective 8: Build community support for conservation		
8.1	Identify opportunities for community involvement in the conservation of the Phantom Wattle. **Responsibility: DSE, PV**	Community nature conservation and Landcare groups aware of the species and support its conservation.

Abbreviations: DECCW – Department of Environment, Climate Change & Water (NSW); DSE – Department of Sustainability and Environment (Vic); PV – Parks Victoria; RBG – Royal Botanic Gardens (M – Melbourne; S – Sydney)

Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of *A. phasmoides*. The emphasis is on using knowledge to better implement *in situ* management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are primarily structured to (i) acquire baseline data, (ii) assess habitat condition including ecological and biological function, (iii) protect populations to maintain or improve population growth and (iv) to engage the community in recovery actions.

On-ground site management will aim to mitigate threatening processes and thereby insure against extinction. Major threats requiring management include competition from pest plants, destruction from feral animals, inappropriate fire regimes and potential grazing by domestic stock. A range of strategies will be necessary to alleviate these threats including weed control, fire management, fencing, and control of feral animals. Protection measures applicable to the population on private land include negotiation for the legal protection of the site, habitat retention and liaison with the landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations.

The Recovery Plan also advocates strategies to fill some of the major gaps in our knowledge to date. These include an understanding of the mechanisms underlying recruitment and regeneration. Successful *in situ* population management will be founded on understanding the relationships between *A. phasmoides* and associated flora, and its response to environmental processes. These are directly linked to biological function and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions. In addition, *ex situ* conservation measures will be required and will include seed storage and plant cultivation.

Affected Interests

In Victoria, all populations of Phantom Wattle occur in a national park managed by Parks Victoria. In NSW most of the population occurs in a national park managed by the Department of Environment, Climate Change and Water (NSW), with a small number of plants occuring on neighbouring private property.

Role and Interests of Indigenous People

Indigenous communities on whose traditional lands the Phantom Wattle occurs have been advised, through the relevant regional Indigenous facilitator, of the preparation of this Recovery Plan and invited to be involved in the implementation of the plan.

Biodiversity Benefits

The Recovery Plan includes a number of potential biodiversity benefits for other species and vegetation communities in New South Wales and Victoria. Principally, this will be through the management of habitat. The adoption of broad-scale management techniques and collection of baseline data will also benefit a number of other plant species growing in association with *A. phasmoides*, particularly those species with similar life forms and/or flowering responses. The Recovery Plan will also provide an important public education role as threatened flora have the potential to act as 'flagship species' for highlighting broader nature conservation and biodiversity issues such as land clearing, grazing, weed invasions and habitat degradation.

Social and Economic Impacts

The implementation of this Recovery Plan is unlikely to cause significant adverse social and economic impacts. Most plants occur in national parks in New South Wales and Victoria. A few plants occur on private property, and their protection will be achieved through voluntary negotiation with the landholders. Protection measures will have negligible impact on farming activities, and therefore there will be minimal economic impact from implementation of recovery actions for Phantom Wattle.

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Priority, Feasibility and Estimated Costs of Recovery Actions

Action	*Description*	*Priority*	*Feasibility*	*Responsibility*	*Cost estimate*					
					Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	**Distribution, abundance**									
1.1	Surveys	1	100%	DSE, PV, DECCW	$15,000	$15,000	$10,000	$10,000	$10,000	$60,000
2	**Habitat requirements**									
2.1	Known habitat	1	80%	DSE, PV	$10,000	$10,000	$0	$0	$0	$20,000
2.2	Potential habitat	2	80%	DSE, PV	$0	$0	$15,000	$15,000	$0	$30,000
3	**Private land protection**									
3.1	Private land	1	80%	DECCW	$0	$5,000	$5,000	$5,000	$0	$15,000
4	**Threat management**									
4.1	Pest plants	2	80%	PV, DECCW	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000
4.2	Pest animals	1	80%	PV, DECCW	$20,000	$25,000	$20,000	$25,000	$20,000	$110,000
5	**Biological functions**									
5.1	Reproductive status	1	80%	DSE	$5,000	$5,000	$5,000	$0	$0	$15,000
5.2	Seed germination	1	80%	DSE	$0	$5,000	$5,000	$5,000	$0	$15,000
5.3	Disturbance regimes	2	80%	DSE	$3,000	$3,000	$3,000	$3,000	$3,000	$15,000
6	**Population viability**									
6.1	Censusing	1	100%	DSE	$6,000	$0	$6,000	$0	$6,000	$18,000
7	**Cultivation**									
7.1	Cultivated plants	2	100%	RBG-M&S	$5,000	$3,000	$2,000	$2,000	$2,000	$14,000
7.2	Seed bank	2	100%	RBG-M&S	$5,000	$5,000	$2,000	$2,000	$2,000	$16,000
8	**Community support**									
8.1	Community extension	3	100%	DSE, PV	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000
				TOTALS	**$80,000**	**$87,000**	**$84,000**	**$78,000**	**$54,000**	**$383,000**