



# Conservation Advice for *Acacia phasmoides* (Phantom Wattle)

In effect under the *Environment Protection and Biodiversity Conservation Act 1999* from 29 September 2021.

This document provides a foundation for conservation action and further planning.



Photo of *Acacia phasmoides* (Phantom Wattle) © Copyright, Murray Fagg (2007)

## Conservation status

*Acacia phasmoides* (Phantom Wattle) is listed in the Vulnerable category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) effective from 16 July 2000. The species is eligible for listing because prior to the EPBC Act, it was listed as Vulnerable under the *Endangered Species Protection Act 1992* (Cwlth).

The Phantom Wattle was listed as Vulnerable due to its limited distribution and small number of subpopulations.

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see the [Species Profile and Threat Database](#).

## Species information

### Taxonomy

Conventionally accepted as *Acacia phasmoides* J.H.Willis (Willis 1967).

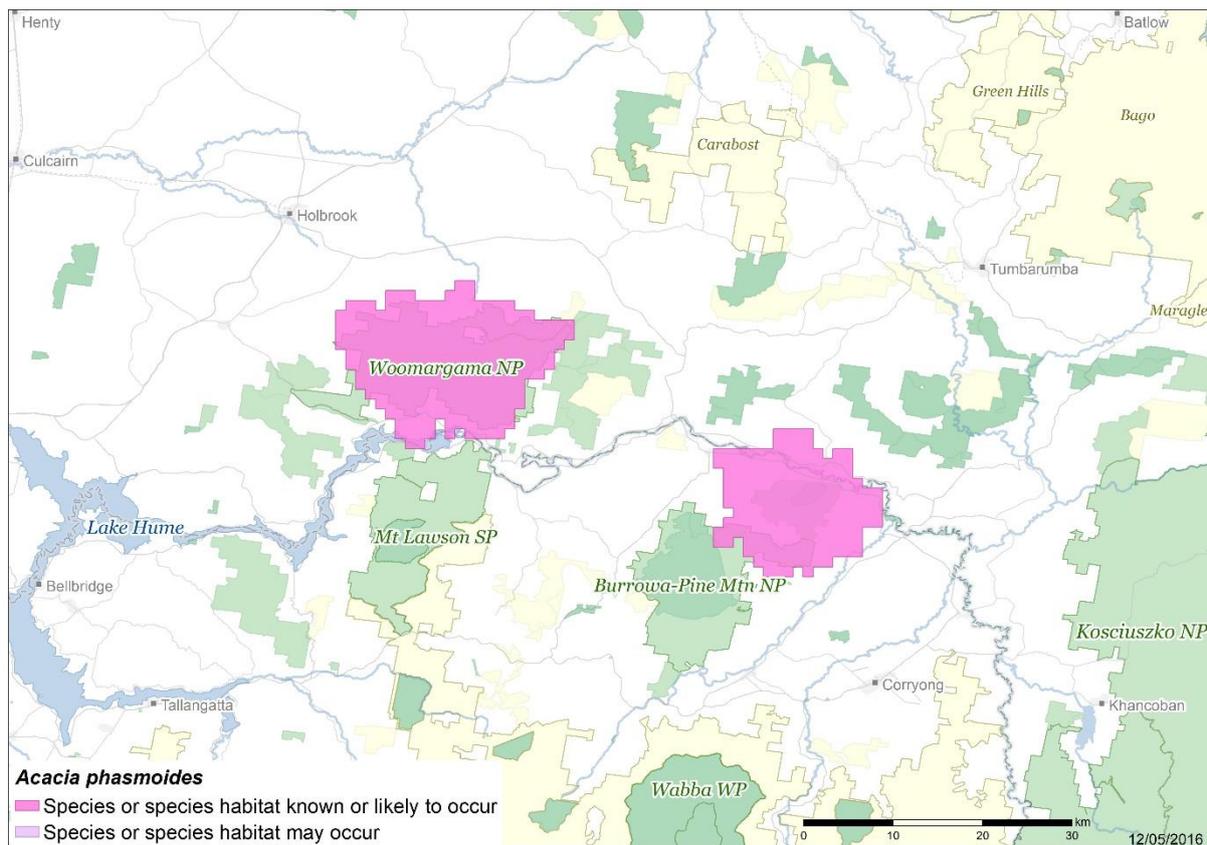
### Description

The Phantom Wattle (family Fabaceae) 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 (VicFlora 2020). The Phantom Wattle may be confused with *Acacia quadrilateralis* and possibly *A. genistifolia* (Spreading Wattle), both of which have pedunculate flower heads, but is distinguished by the combination of very narrow phyllodes more than 4 cm long and the obloid to globular inflorescence (PlantNet 2021).

### Distribution

The Phantom Wattle is restricted to two subpopulations in small areas of north-eastern Victoria and south-eastern New South Wales (ALA 2020). In New South Wales, there is a single subpopulation of about 2000 plants east of Holbrook (NSW NPWS 2020), with most of the plants occurring in Woomargama National Park and a few plants growing on adjoining private property to the south of the park (although these were not relocated during surveys in 2012; DPIE 2021). In Victoria, there is a single subpopulation in Burrowa-Pine Mountain National Park near Corryong, where the species occurs in four documented areas to the west and south of Pine Mountain summit, with a total of about 500 plants (DELWP 2016). However, it is reportedly more widespread in the Park also occurring in drainage lines to the east of the summit (Parks VIC 2020). Conservation translocations were undertaken in 2011 and 2013 with plants persisting as of 2020 (DELWP 2020).

**Map 1 Modelled distribution of the Phantom Wattle**



**Source:** Species distribution data [Species of National Environmental Significance](#) database, Base map Geoscience Australia.

**Caveat:** The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.

**Species distribution mapping:** The species distribution mapping categories are indicative only and aim to capture (a) the specific habitat type or geographic feature that represents to recent observed locations of the species (known to occur) or preferred habitat occurring in close proximity to these locations (likely to occur); and (b) the broad environmental envelope or geographic region that encompasses all areas that could provide habitat for the species (may occur). These presence categories are created using an extensive database of species observations records, national and regional-scale environmental data, environmental modelling techniques and documented scientific research.

## Cultural and community significance

The New South Wales subpopulation occurs in the Albury and District Local Area Land Council (ALC 2020). Currently there are no formally recognised Traditional Owner Groups for the Victorian subpopulation (Aboriginal Victoria 2020). The cultural significance of Phantom Wattle is not well understood, although many *Acacia* species were used by Indigenous people for a variety of purposes (Australian National Botanic Gardens 2007).

## Relevant biology and ecology

### Reproductive ecology

The flowering period of the Phantom Wattle is from September to December, apparently later (November to December) in Victoria and earlier (from September onwards) in New South Wales (VicFlora 2020; DPIE 2021). As the Phantom Wattle is very difficult to detect when not flowering, surveys should be undertaken when the species is flowering (DPIE 2015). Wattle species are mostly pollinated by insects, particularly bees, and offer only pollen as a reward

(Stone et al. 2003). Seed exhibits dormancy but germinates quickly (50 percent in eight days) following a pre-treatment (nicking or fire) (Offord et al. 2004). Little is known about longevity or generation length of the Phantom Wattle.

### **Habitat ecology**

In New South Wales the Phantom Wattle occurs on seasonally damp granite-derived soils in very close proximity (typically less than 8 m; DPIE 2021) to ephemeral creeks and their tributaries (Harden 1991; DECCW pers. comm. in Sutter 2010), from 220–390 m altitude. There, it occurs in woodland dominated by *Eucalyptus bridgesiana* (Apple Box), *Callitris endlicheri* (Black Cypress-pine) and *Brachychiton populneus* (Kurrajong) with a shrubby understorey of *Bursaria calcicola* (Bursaria), *Kunzea ericoides* (Burgan), *Callistemon sieberi* (River Bottlebrush), *C. citrinus* (Crimson Bottlebrush), *Calytrix tetragona* (Common Fringe-myrtle), *Leptospermum* spp. (Tea-tree), *Correa lawrenceana* (Mountain Correa), *Bossiaea buxifolia* (Box-leaved Bossiaea), *Dodonaea viscosa* (Sticky Hop-bush), *Acacia verniciflua* (Varnish Wattle), *Callistemon pallidus* (Lemon Bottlebrush) and *Pteridium esculentum* (Bracken) (DECCW pers. comm. in Sutter 2010; DPIE 2021).

In Victoria, Phantom Wattle grows in woodland above 600 m altitude on granitic slopes in sheltered areas. It grows in cracks between rocks where soil cover is sparse and annual rainfall is between 700–1000 mm (Sutter 2010; VicFlora 2020). Overstorey species include *Eucalyptus macrorhyncha* (Red Stringybark), *E. dives* (Broad-leaved Peppermint) and Black Cypress-pine, with an understorey of Burgan, *Grevillea jephcottii* (Green Grevillea) and *Dodonaea rhombifolia* (Broad-leaf Hop-bush) (DELWP 2020).

### **Fire ecology**

Little is known about the Phantom Wattle's response to fire, although the species appears capable of some basal resprouting, particularly when subject to low or medium intensity fire (DELWP 2020; DPIE 2021). Plants are regularly observed with basal or epicormic shoots following presumed drought stress (DPIE 2021). There is no information yet on seed germination post-fire, but the species probably recruits from soil-stored seed following fire like many wattles (Palmer 2016). The related *A. genistifolia* (Spreading Wattle) is apparently an obligate seeder relying on seed recruitment to recover from fires (Purdie 1977; Brown et al. 2003). High frequency (<10 years), high intensity fires may disrupt the life cycle of the species (DPIE 2021).

### **Habitat critical to the survival**

New data suggests that since this species was last assessed, it is likely to be eligible for listing as Endangered when reassessed. Due to the species eligibility for listing (highly restricted range and small population size), all habitat is considered critical to the survival of the species.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

### **Important populations**

In this section, the word population is used to refer to subpopulation, in keeping with the terminology used in the EPBC Act and state/territory environmental legislation.

New data suggests that since this species was last assessed, it is likely to be eligible for listing as Endangered when reassessed. There is sufficient evidence through the species eligibility for

listing, to declare all populations/the national population of this species as important populations under particular pressure of survival and which therefore require protection to support the recovery of the species.

## Threats

The major threats to Phantom Wattle are climate change-driven fires and droughts, herbivory from feral herbivores particularly during the post-fire recovery stage and the genetic consequences of small subpopulations (Table 1). Phantom Wattle is threatened by several fire-related threats, including high frequency fire, fire-drought interactions and fire promoted weed invasion.

**Table 1 Threats impacting Phantom Wattle**

Threat	Status and severity <sup>a</sup>	Evidence
Climate Change		
Increased frequency and severity of bushfires	<ul style="list-style-type: none"> <li>• Timing: current</li> <li>• Confidence: known</li> <li>• Consequence: major</li> <li>• Trend: increasing</li> <li>• Extent: across the entire range</li> </ul>	<p>The CSIRO &amp; Bureau of Meteorology (2015) predict eastern Australia will experience increased frequency and severity of bushfires.</p> <p>The 2019–20 bushfires burnt approximately 51% of the modelled range of Phantom Wattle (Gallagher 2020), including nearly the entire Victorian subpopulation and approximately one third of the plants in the known NSW subpopulation. Fire intensity was severe across most of the Vic subpopulation and was of varying intensity in NSW (DELWP 2020; NSW NPWS 2020). Post-fire recovery is not yet clear, although there is evidence of at least some Victorian plants resprouting from the base, while in NSW, varying fire intensity resulted in some short-term regeneration of plants while others were not observed to be responding at three months post-fire (DELWP 2020; NSW NPWS 2020). There is no information yet on seed germination post-fire, but the species probably recruits from soil-stored seed following fire like many wattles (Palmer 2016).</p> <p>The major threat from increased fire frequency and severity is likely to be the cumulative impacts of multiple fires occurring at short intervals, which could kill recovering adult and immature plants and deplete the soil seed bank (Palmer 2016). High frequency (&lt;10 years), high intensity fires may disrupt the life cycle of the species (DPIE 2021). Furthermore, high frequency fires interact with other threats, namely drought and competition with weeds which further compound the impact of fire on Phantom Wattle.</p>

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<p>Increased frequency and severity of drought</p>	<ul style="list-style-type: none"> <li>• Timing: current</li> <li>• Confidence: suspected</li> <li>• Consequence: moderate</li> <li>• Trend: increasing</li> <li>• Extent: across the entire range</li> </ul>	<p>Climate projections for south eastern Australia include reduced rainfall, increased average temperatures, and more frequent droughts (CSIRO &amp; Bureau of Meteorology 2015).</p> <p>Given its apparent preference for seasonally damp situations, climate change may pose a substantial threat to the Phantom Wattle, through increased drying of habitat. Phantom Wattle tends to grow in damp and sheltered situations, and drought conditions through the Millennium Drought were implicated in the decline of plant numbers, with a number of dead and dying plants observed in the Victorian subpopulations (Sutter 2010). In 2000, plants in NSW were observed to be vigorously suckering from rootstocks following some die-back due to dry conditions (DECCW, pers comm in Sutter 2010).</p> <p>Furthermore, Phantom Wattle, like other resprouting shrubs, may be subject to threat from fire-drought interactions. Resprouting stems are vulnerable to embolization and drastically lowered xylem hydraulic conductivity during post-fire drought, increasing individual mortality risk (Pratt et al. 2014).</p>
<p>Invasive species</p>		
<p>Browsing by introduced herbivores</p>	<ul style="list-style-type: none"> <li>• Timing: current</li> <li>• Confidence: known</li> <li>• Consequence: major</li> <li>• Trend: unknown</li> <li>• Extent: across the entire range</li> </ul>	<p>Continuous browsing by introduced herbivores can kill adults and seedlings and is a threat to both subpopulations (DPIE 2020).</p> <p>Feral Goats (<i>Capra aegagrus hircus</i>), Feral Pigs (<i>Sus scrofa</i>), European Rabbits (<i>Oryctolagus cuniculus</i>) and Sambar Deer (<i>Rusa unicolor</i>) are present in the area where the species occurs (Sutter 2010). Severe grazing by Sambar Deer was observed on unburnt plants following the 2019–20 bushfires (DELWP 2020).</p>
<p>Competition with weeds</p>	<ul style="list-style-type: none"> <li>• Timing: current</li> <li>• Confidence: known</li> <li>• Consequence: minor</li> <li>• Trend: unknown</li> <li>• Extent: across part of range</li> </ul>	<p>The invasion of native plant communities by exotic perennial grasses is listed as a key threatening process (KTP) under the Biodiversity Conservation Act in NSW (NSW Scientific Committee 2003). Introduced grasses have the potential to invade native vegetation and may threaten Phantom Wattle by outcompeting the plants directly, particularly after fire which may create gaps for superior competitors, or by indirectly altering fuel loads and fire regimes (D'Antonio &amp; Vitousek 1992; NSW Scientific Committee 2003; DPIE 2020).</p>

		The few plants in the NSW subpopulation that grow on private land are affected by invasion of annual grasses (Sutter 2010).
Genetic threats resulting from small and fragmented subpopulations		
Small subpopulation size	<ul style="list-style-type: none"> <li>• Timing: current</li> <li>• Confidence: suspected</li> <li>• Consequence: moderate</li> <li>• Trend: unknown</li> <li>• Extent: across part of range</li> </ul>	Many small, isolated subpopulations are subject to the effects of low genetic diversity (Frankham et al. 2014) and stochastic events. It is possible that Phantom Wattle has low genetic diversity, particularly in the smaller Victorian subpopulation.

Status—identify the temporal nature of the threat;

Confidence—identify the extent to which we have confidence about the impact of the threat on the species;

Consequence—identify the severity of the threat;

Trend—identify the extent to which it will continue to operate on the species;

Extent—identify its spatial content in terms of the range of the species.

Each threat has been described in Table 1 in terms of the extent that it is operating on the species. The risk matrix (Table 2) provides a visual depiction of the level of risk being imposed by a threat and supports the prioritisation of subsequent management and conservation actions. In preparing a risk matrix, several factors have been taken into consideration, they are: the life stage they affect; the duration of the impact; and the efficacy of current management regimes, assuming that management will continue to be applied appropriately. The risk matrix and ranking of threats has been developed in consultation with experts using available literature.

**Table 2 Phantom Wattle risk matrix**

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
<b>Almost certain</b>	Low risk	Moderate risk	Very high risk <b>Increased frequency and intensity of drought</b>	Very high risk <b>Increased frequency and intensity of bushfires</b>	Very high risk
<b>Likely</b>	Low risk	Moderate risk <b>Competition with weeds</b>	High risk	Very high risk <b>Browsing by introduced herbivores</b>	Very high risk
<b>Possible</b>	Low risk	Moderate risk	High risk <b>Small subpopulation size</b>	Very high risk	Very high risk
<b>Unlikely</b>	Low risk	Low risk	Moderate risk	High risk	Very high risk
<b>Unknown</b>	Low risk	Low risk	Moderate risk	High risk	Very high risk

Priority actions have then been developed to manage the threat particularly where the risk was deemed to be ‘very high’ or ‘high’. For those threats with an unknown or low risk outcome it may be more appropriate to identify further research or maintain monitoring.

## Conservation and recovery actions

### Primary conservation objective

By 2030, the population of Phantom Wattle will have increased in abundance and viable populations are sustained in habitats where very high risk threats are managed effectively.

### Conservation and management priorities

#### Climate change and fire

- Develop and implement a fire management strategy that optimises the survival of Phantom Wattle.
  - Avoid planned burns in all recently burnt habitat.
  - Protect unburnt subpopulations (no planned burns, clearing or other disturbance).
  - Take the likelihood of increasingly frequent bushfires into account when developing planned burning programs, to avoid excessively frequent burning of any subpopulations.
- Survey burnt subpopulations after planned and unplanned fires to improve understanding of the fire response of this species.
- Identify current and future habitat likely to remain or become suitable habitat due to climate change.
- Implement an ongoing monitoring program that will provide data capable of addressing the link between population dynamics and drought.

#### Invasive species

- Reduce the impacts of habitat destruction and browsing by feral herbivores by using fencing or herbivore control, particularly during the post-fire recovery phase for subpopulations burnt in the 2019–20 bushfires, including as described in the *Threat abatement plan for competition and land degradation by unmanaged goats* (DEWHA 2008), *Threat abatement plan for competition and land degradation by rabbits* (DOEE 2016) and *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa)* (DOEE 2017).
- Maintain boundary fences to prevent stock from accessing the subpopulation in NSW.
- Monitor the impacts of weeds across all populations and implement appropriate control measures if there is evidence to suggest that weeds are, or have the potential to become, a threat capable of causing a decline of the subpopulation.

#### Genetic threats resulting from small and fragmented subpopulations

- Collect and maintain ex-situ seed collections at appropriate institutions from all subpopulations to ensure genetic diversity is captured.
- If appropriate, continue to create new subpopulations by implementing conservation translocations in accordance with the *Guidelines for the Translocation of Threatened Plants in Australia* (Commander et al. 2018).

## Stakeholder engagement/community engagement

- Engage and involve Traditional Owners in conservation actions, including survey, monitoring and management actions.
- Liaise with the local community and government agencies to ensure that up-to-date population data and scientific knowledge inform the implementation of conservation actions for this species.
- Engage interested nature conservation, land management and land holder groups in conservation management activities, such as survey and monitoring, and the broader local community through participation at local community events and collaboration with local schools.

## Survey and monitoring priorities

- Conduct targeted surveys throughout the range of the Phantom Wattle to better define its distribution and abundance, particularly in unburnt habitat in NSW.
- Establish and maintain a monitoring program of burnt and unburnt subpopulations to:
  - document post-fire recovery;
  - determine minimum tolerable fire intervals;
  - determine trends in subpopulation size and distribution;
  - determine threats and their impacts; and,
  - monitor the effectiveness of management actions and the need to adapt them if necessary.

## Information and research priorities

- Improve understanding of post-fire recovery, subpopulation trends, feral herbivore threats and the effect of drought, through monitoring.
- Investigate the population genetics of both NSW and Victorian subpopulations to determine the appropriateness of genetic mixing between subpopulations.

## Links to relevant implementation documents

[National Recovery Plan for Phantom Wattle \*Acacia phasmoides\* \(2010\)](#)

[Threat abatement plan for competition and land degradation by rabbits \(2016\)](#)

[Threat abatement plan for competition and land degradation by unmanaged goats \(2008\)](#)

[Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs \(\*Sus scrofa\*\) \(2017\)](#)

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