

**National Recovery Plan for the
Concave Pomaderris
*Pomaderris subplicata***

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Australian Government

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Published by the Victorian Government Department of Sustainability and Environment (DSE) Melbourne, November 2006.

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ISBN 1 74152 342 7

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Citation: Carter, O. 2006. National Recovery Plan for the Concave Pomaderris *Pomaderris subplicata*. Department of Sustainability and Environment, Melbourne.

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Summary

The Concave Pomaderris *Pomaderris subplicata* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 and Threatened under the Victorian *Flora and Fauna Guarantee Act* 1988. The species is endemic to north-eastern Victoria, where there are only two wild populations containing about 220 plants. Major threats to populations include weed invasion, grazing and lack of regeneration, and accidental damage. This national Recovery Plan for *P. subplicata* details the species' distribution and biology, conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Description

The Concave Pomaderris *Pomaderris subplicata* is an erect, multi-stemmed shrub growing to 2 m tall. It has ovate to elliptic, flat to v-shaped, dark green leaves, 3–10 mm long and 2–6 mm wide. Star-shaped hairs cover both surfaces of a leaf, soft and fine on the upper surface and giving a white facade to the lower surface. Single coppery-coloured hairs to 1 mm long occur on veins of the leaf lower surface. Flowers are pale yellow, have a soft covering of star-shaped hairs on their external surface, and grow in small, dense groups at the end of branchlets in October. Fruits are small, round and hairy (description from Walsh 1992; Walsh & Entwisle 1999). The Concave Pomaderris can be distinguished from other *Pomaderris* species in Victoria by the combination of leaves no longer than 3.5 times their width, star-shaped hairs on young branches and leaves, and smooth leaf edges. Flowers may or may not have petals; if present, petals fall immediately after flowering, the sepals soon after (Walsh 1992).

There have been no specific studies of the biology or ecology of *Pomaderris subplicata*. A large proportion (65%) of the Carboor Upper population comprises senescing mature individuals, with only 22 seedlings recorded, and propagation trials suggest seed production and viability may be low (Johnson *et al.* 1997). Mature plants appear to be able to resprout from the base.

Distribution

Pomaderris subplicata is endemic to Victoria, where it is confined to two wild populations in north-east of the State, near Carboor Upper, about 40 km south-east of Wangaratta, in the South Eastern Highlands IBRA Bioregion (DEH 2000).

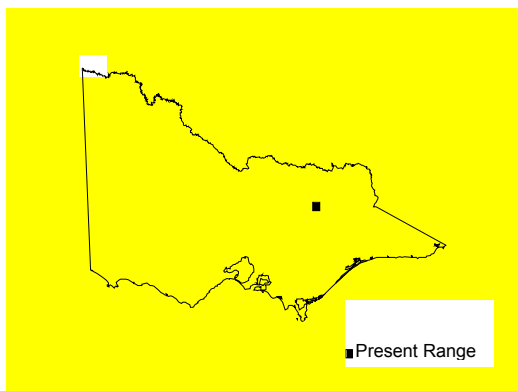


Figure 1. Distribution of *Pomaderris subplicata* in Victoria

Maps showing the detailed distribution of *P. subplicata* are available from the Department of Sustainability and Environment Flora Information System (DSE-FIS). The FIS is a state-wide repository for flora grid and site distribution data, photographs and text descriptions. This information is available on request in a variety of formats for natural resource management purposes.

Population Information

Two wild populations of *P. subplicata* are known, comprising a total of about 220 plants occur in the following locations:

1. Carboor Upper, on crown land leased to Hancock Victorian Plantations Pty Ltd, and comprising about 200 plants. In 1997, four plants occurred on adjoining private land (Johnson *et al.* 1997). Surveys in 1986 within forest remnants surrounding the site failed to locate any new populations (Johnson *et al.* 1997).
2. Carboor East, on roadside in the Rural City of Wangaratta, comprising about 20 plants.

In addition, about 130 seedlings have been planted in 12 sites in the Carboor Upper area, on both private and public land, including 30 in the Carboor Upper population in 2000.

Habitat

The Carboor Upper population of *P. subplicata* occurs in woodland/shrubland dominated by *Eucalyptus macrorhyncha* and *Eucalyptus goniocalyx*, with *Pteridium esculentum* and *Acacia dealbata* as associated understorey species. Terrain is flattish to steeply falling south to south-west. Soils are skeletal and derived from Ordovician sediments, and mean annual rainfall is about 1,000 mm (Johnson *et al.* 1997). The Carboor East roadside population has an overstorey of *Eucalyptus radiata* and *E. goniocalyx*, with *Cassinia aculeata*, *Acacia dealbata*, *Acacia melanoxylon*, *Pteridium esculentum* and *Poa labillardierei* as associated understorey plants. This site slopes gently to the south and occurs on loamy soils derived from sediments. Altitudinal range is 350–460 m above sea level. Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

The Concave Pomaderris was probably once more widespread and abundant within the region where it currently occurs, but populations have been fragmented and depleted historically by land clearance for settlement and agriculture, although there is no direct evidence to support this. Both populations occur in native forest remnants, surrounded by pine plantations and cleared grazing land, and neither is in a secure conservation reserve. The Carboor Upper population declined from 204 plants in 1996 to 165 plants in 1999, although this has since been supplemented by planting of 30 seedlings in 2000. With the extremely limited distribution and very low numbers of plants of this species, the risk from stochastic events such as accidental clearing is high. The main threats to the species are summarised as follows:

Weed invasion: Environmental weeds including *Rubus discolor* (a Weed of National Significance) and *Hypericum perforatum*, as well as the native *Pteridium esculentum*, appear to be restricting seedling regeneration (Johnson *et al.* 1997). Woody weed invasion by *Crataegus monogyna* and *Pinus radiata*, particularly at the Carboor Upper population, poses a threat by competitive exclusion of existing plants and seedling recruitment.

Grazing: Grazing by Rabbits and native herbivores including Common Wombat and Black Wallaby was observed on about 40% of seedlings in 1997 (Johnson *et al.* 1997), and may be a major factor in inhibiting seedling establishment and recruitment. Competition and land degradation by feral Rabbits is listed under the EPBC Act as a Key Threatening Process.

Road works: These pose a potential threat to the Carboor East roadside population through accidental damage.

Inappropriate fire regimes: The effects of fire on *P. subplicata* are unknown, although frequent fire is likely to further promote weeds and *P. esculentum*, placing more pressure on populations.

Low population viability: The two wild populations may be exhibiting the effects of isolation and low numbers of individuals. A large proportion (65%) of the Carboor Upper population comprises senescing mature individuals, and only 22 seedlings have been recorded (Johnson *et al.* 1997). Regeneration of seedlings may be restricted by weed competition, grazing by native and introduced herbivores or the absence of an appropriate disturbance regime. Because of low numbers and isolation, plants may also be unable to attract suitable pollinators, and this may result in low seed production (Johnson *et al.* 1997).

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Pomaderris subplicata* in the wild and to increase the probability of important populations becoming self-sustaining in the long term.

Within the life span of this Recovery Plan, the **specific objectives** of recovery for *Pomaderris subplicata* are to:

- Acquire accurate information for conservation status assessments.
- Identify habitat that is critical, common or potential.
- Ensure that all populations and their habitat are protected and managed appropriately.
- Manage threats to populations.
- Identify key biological functions.
- Determine the growth rates and viability of populations.
- Establish populations in cultivation.
- Establish cultivated plants in the wild.
- Build community support for conservation.

Program Implementation

The Recovery Plan will run for five years from the time of implementation and will be managed by the Department of Sustainability and Environment. A Threatened Flora Recovery Team, consisting of scientists, land managers and field naturalists will be established to oversee threatened flora recovery in Victoria in general. Technical, scientific, habitat management or education components of the Recovery Plan will be referred to specialist sub-committees on research, *in situ* management, community education and cultivation. Regional Recovery Teams will be responsible for preparing work plans and monitoring progress toward recovery.

Program Evaluation

The Recovery Team will be responsible for annual assessments of progress towards recovery. This Recovery Plan will be reviewed within five years of the date of adoption.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific objective 1		
Acquire accurate information for conservation status assessments		
1.1	Acquire baseline population data by conducting detailed field including (a) identification of the area and extent of populations; (b) estimates of the number, size and structure of populations and (c) inference or estimation of population change. Responsibility: DSE	<ul style="list-style-type: none"> Determination or update of conservation status for inclusion on state and national threatened species lists. Populations accurately mapped.
Specific objective 2		
Identify habitat that is critical, common or potential		
2.1	Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition. Responsibility: DSE	<ul style="list-style-type: none"> Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. Habitat critical to the survival of the species is mapped.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. Responsibility: DSE	<ul style="list-style-type: none"> Predictive model for potential habitat developed and tested.
Specific objective 3		
Ensure that all populations and their habitat are legally protected		
3.1	Protect populations on public land. Responsibility: DSE	<ul style="list-style-type: none"> Negotiate Public Authority Management Agreements under the <i>FFG Act 1988</i> at Carboor East Roadside and Carboor Upper site.
3.2	Protect populations on private property. Responsibility: DSE	<ul style="list-style-type: none"> Initiate private land management agreements in consultation with private land owners under the <i>Victorian Conservation Trust Act 1972</i>, <i>The Conservation, Forests and Lands Act 1987</i> and the <i>Wildlife Act 1975</i> at private land site.

Action	Description	Performance Criteria
Specific objective 4		
Manage threats to populations		
4.1	Identify disturbance regimes to maintain habitat. Responsibility: DSE	<ul style="list-style-type: none"> Preparation of prescriptions for fire management at Carboor Upper site.
4.2	Control threats from pest plants using chemical control and/or manual removal of weeds; control threats from rabbits by chemical control; control damage from native animals by fencing sites; develop a communication strategy to ensure protection from activities associated with roadworks, earthworks and planning applications. Responsibility: DSE	<ul style="list-style-type: none"> Measurable seedling recruitment/vegetative regeneration and measurable reduction in plant mortality at Carboor East Roadside and Carboor Upper site. Inclusion of Carboor East Roadside site onto Rural City of Wangaratta GIS based roadside management strategy.
Specific objective 5		
Identify key biological functions		
5.1	Evaluate current reproductive/regenerative status, seed bank status, by determining longevity, fecundity and recruitment levels. Responsibility: DSE	<ul style="list-style-type: none"> Seed bank/regenerative potential quantified for each population.
5.2	Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration. Responsibility: DSE	<ul style="list-style-type: none"> Stimuli for recruitment/regeneration identified. Management strategies identified to maintain, enhance or restore processes fundamental to reproduction and survival.
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	<ul style="list-style-type: none"> Techniques for monitoring developed and implemented. Census data for target populations.
6.2	Collate, analyse and report on census data and compare with management histories. Responsibility: DSE	<ul style="list-style-type: none"> Population growth rates determined and Population Viability Analysis completed for target populations.

Action	Description	Performance Criteria
Specific objective 7		
Establish populations in cultivation		
7.1	Establish cultivated plants <i>ex situ</i> for inclusion in living collections to safeguard against any unforeseen destruction of wild populations. Responsibility: DSE, RBG	<ul style="list-style-type: none"> • Development of effective propagation and cultivation techniques. RBG and the Society for Growing Australian Plants have initiated some propagation trials. • At least 10 mature plants in cultivation.
7.2	Establish a seed bank and determine seed viability. Responsibility: DSE	<ul style="list-style-type: none"> • Long-term storage facility identified. • Seed from target populations in storage.
Specific objective 8		
Establish cultivated plants in the wild		
8.1	Select and evaluate suitable translocation site that is ecologically and biologically suitable, has secure land tenure and are managed appropriately. Responsibility: DSE	<ul style="list-style-type: none"> • Criteria for site suitability identified and site(s) selected. • Preparation of translocation plan.
8.2	Establish a minimum population size of cultivated plants. Responsibility: DSE, RBG	<ul style="list-style-type: none"> • An additional 200 plants in cultivation that are disease free, vigorous and suitable for translocation.
8.3	Prepare site(s) to achieve maximum survival of translocated plants and implement translocation plan. Responsibility: DSE, RBG	<ul style="list-style-type: none"> • Development of successful translocation techniques.
8.4	Maintain and monitor translocated plants. Responsibility: DSE	<ul style="list-style-type: none"> • At least 30% survival of translocated plants.
Specific objective 9		
Build community support for conservation		
9.1	Identify opportunities for community involvement in the conservation of <i>P. subplicata</i> . Responsibility: DSE	<ul style="list-style-type: none"> • Presentation(s) to community nature conservation groups.

Abbreviations: DSE - Department of Sustainability and Environment, Victoria; RBG - Royal Botanic Gardens, Melbourne

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 *Pomaderris subplicata*. 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 (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 ensure against extinction. Major threats requiring management include accidental destruction, competition from pest plants, inappropriate fire regimes and grazing by pest animals. A range of strategies will be necessary to alleviate these threats including weed control, fire management, fencing, and control of pest animals.

Broad-scale protection measures applicable to all populations include legal protection of sites, habitat retention and liaison with land managers including private 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 *P. subplicata* 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 to the above, *ex situ* conservation measures will be required and will include seed storage and plant cultivation. Cultivating *ex situ* populations will also aim to increase the amount of seed available for reintroduction to sites. Translocation of cultivated plants will be considered as there is a high chance of success and secure site(s) exist.

Community participation in recovery actions will be sought, particularly in regard to recovery team membership and implementation of on-ground works.

To reduce the likelihood of unforeseen development activities negatively impacting upon *P. subplicata*, the threatened flora team should seek relevant information on its distribution, ecology and/or habitat to relevant land managers. Such increased awareness should allow new populations to be found if they exist, and improve the likelihood of adequate searches being made during environmental impact assessments.

Affected interests

The Carboor East roadside population of *P. subplicata* fall under the jurisdiction of the Rural City of Wangaratta, who have approved the actions outlined in this Recovery Plan, subject to the availability of sufficient funding. The Carboor Upper population occurs on crown land leased to Hancock Victorian Plantations Pty Ltd, and protection measures will be negotiated with the company.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Pomaderris subplicata* occurs will be advised, through the relevant DSE Regional Indigenous Facilitator, of the preparation of this Recovery Plan and invited to provide comments if so desired. Indigenous communities will be invited to be involved in the implementation of the Recovery Plan.

Benefits to other species/ecological communities

The Recovery Plan includes a number of potential biodiversity benefits for other species and vegetation communities in Victoria. Principally, this will be through the protection and 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 *Pomaderris subplicata*, 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. Only two populations are known, one on a roadside and another on leased Crown land, and protection measures will have no social impact and negligible impact on commercial operations. Protection on the leased crown land site will be achieved through negotiation with the timber company. Some landholders are planting this species in an effort to establish new populations to improve its conservation status.

Acknowledgments

The authors would like to thank Andrew Briggs (Rural City of Wangaratta), Anna H. Murphy, Fiona Coates and Gary Backhouse (DSE) for their contributions to this Recovery Plan.

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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	Conservation status									
1.1	Collect baseline data	1	100%	DSE	\$5,000	\$0	\$0	\$0	\$0	\$5,000
2	Habitat requirements									
2.1	Survey known habitat	1	100%	DSE	\$10,000	\$0	\$0	\$0	\$0	\$10,000
2.2	Identify, survey potential habitat	1	75%	DSE	\$10,000	\$0	\$0	\$0	\$0	\$10,000
3	Legal protection of habitat									
3.1	Protect public land habitat	1	75%	DSE	\$0	\$10,000	\$6,000	\$0	\$0	\$16,000
3.2	Protect private land habitat	1	75%	DSE	\$0	\$10,000	\$6,000	\$0	\$0	\$16,000
4	Manage threats									
4.1	Identify disturbance regimes	2	75%	DSE	\$0	\$8,000	\$0	\$0	\$0	\$8,000
4.2	Control threats	1	75%	DSE	\$10,000	\$10,000	\$6,000	\$2,000	\$2,000	\$30,000
5	Identify key biol. functions									
5.1	Evaluate reproductive status	3	75%	DSE	\$0	\$12,000	\$12,000	\$0	\$0	\$24,000
5.2	Seed germination	3	75%	DSE	\$0	\$10,000	\$10,000	\$0	\$0	\$20,000
6	Growth rates, pop. viability									
6.1	Conduct censusing	3	100%	DSE	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000
6.2	Collate, analyse and report	3	100%	DSE	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000	\$9,000
7	Establish pops. in cultivation									
7.1	Establish cultivated plants	3	50%	DSE, RBG	\$0	\$6,000	\$6,000	\$6,000	\$6,000	\$24,000
7.2	Establish a seed bank	2	50%	DSE	\$0	\$4,000	\$4,000	\$4,000	\$4,000	\$16,000
8	Establish pops. in the wild									
8.1	Select sites	3	100%	DSE	\$0	\$8,000	\$0	\$0	\$0	\$8,000
8.2	Cultivate plants for translocation	3	50%	DSE, RBG	\$0	\$10,000	\$10,000	\$10,000	\$10,000	\$40,000
8.3	Prepare site, implement plan	3	50%	DSE, RBG	\$0	\$10,000	\$10,000	\$10,000	\$0	\$30,000
8.4	Maintain and monitor	3	50%	DSE	\$0	\$0	\$10,000	\$10,000	\$10,000	\$30,000
9	Education, communication									
9.1	Community extension	3	100%	DSE	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$30,000
TOTAL					\$57,000	\$120,000	\$102,000	\$64,000	\$58,000	\$391,000