

Flora & Fauna Guarantee Action Statement

#31

This Action Statement was first published in 1991 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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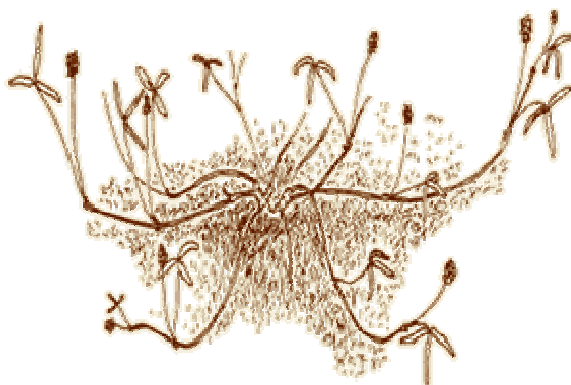
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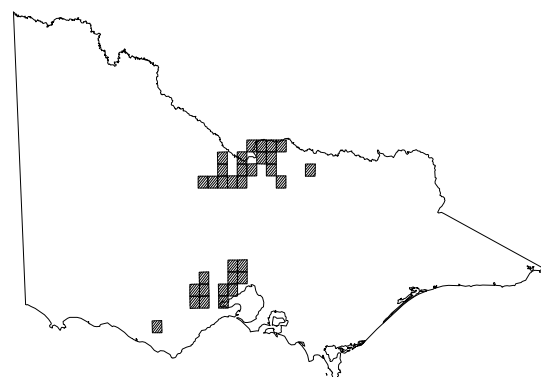
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Small Psoralea

Psoralea parva



Small Psoralea (*Psoralea parva*)
(Illustration Simon Cropper)



Distribution in Victoria (DSE 2002)

Description and Distribution

Small Psoralea (*Psoralea parva* F. Muell.), a member of the Fabaceae family, is an almost hairless perennial herb with short slender stems. It has lanceolate to oblong leaves, 1-2 cm long, arranged in threes on long stalks. The pale lilac to pale pink pea flowers are arranged in small dense clusters, 1-2 cm long, borne on erect branched flower stems. Flowering occurs between October and February. The fruit is a pod with dense white hairs. For a full botanical description, refer to Jessop & Toelken (1986).

The species grows in grassland and grassy woodland. These sites are subject to irregular flooding, and have relatively rich soils derived from alluvium. The exception is the Shelford population, which grows on rocky clay soils derived from basalt.

Although the species was considerably more widespread in the past, there are now only eight known populations of Small Psoralea in Victoria. None of these populations are in conservation reserves.

The main stronghold of the species is in the Barmah State Park and State Forest.

It was recorded in 1991 at four localities: McConnachie's Ridge (approximately 400 plants in an area of 200 m²), Tongalong ridge (more than 10 000 plants over about 5 ha), Manions Yard (about 8000 plants in 2000 m²) and a ridge just west of Yielima Pre-emptive Right (about 200 plants in 100 m²).

At these sites the species is confined to the transition zone between River Red Gum (*Eucalyptus camaldulensis*) areas and slightly elevated Yellow Box (*Eucalyptus melliodora*) or Grey Box (*Eucalyptus microcarpa*) areas. This habitat is subject to irregular winter flooding. Further searching at the edges of box ridges may possibly reveal a few more populations.

Two known populations of the species were thought to have disappeared in the past ten years from Broken Creek, near Nathalia, but searching in 1992 revealed a site supporting five plants. The plants are growing under a fenceline between a narrow road verge and private property.

Two other populations of the species in the north of the state were relocated in 1991. These are both south of Echuca: along the rail reserve at Strathallan (about 300 plants in 200 m²), and at the Rochester golf course (300 plants in 0.5 ha). Both sites are highly modified grasslands subject to irregular flooding from a drainage swale along the rail line at Strathallan and artificial irrigation at Rochester.

The species is less secure south of the Great Dividing Range. A population of Small Psoralea was discovered in 1991 along the road reserve between Shelford and Mt Mercer (approximately 30 plants in an area of 1500 m²). The population is part of a grassland remnant which is in very good condition. A single plant was discovered at Deer Park in 1992.

One plant remaining in a rail reserve at Inverleigh (west of Geelong) was destroyed by ploughing of a fire-break in 1992. A population at Taylors Lakes has been destroyed in recent years. Small Psoralea is known in South Australia from the mid north (three sites on road and rail reserves), one site north of Adelaide and one site south of Adelaide (R. Davies pers. comm.). These sites have not been checked recently, and the current status is unknown.

The species is believed to be extinct in New South Wales (Leigh *et al.* 1984).

Conservation Status

Current Status

Gullan, Cheal & Walsh (1990) Endangered in Victoria
Briggs & Leigh (1988) Endangered in Australia

The Small Psoralea has been listed as a threatened taxon on Schedule 2 of the *Flora and Fauna Guarantee Act 1988*.

Reasons for Conservation Status

Small Psoralea has been eliminated from much of its former range due to the destruction and degradation of its habitat (grassy woodland and grassland) throughout the state. Activities associated with agriculture have been the main reason for its decline. Searches of localities where it has been recorded in the past (the Wimmera, Lara-Werribee, Benalla and Sale-Maffra areas) have failed to find the species (Scarlett 1986).

Future threats to the species are associated with the management practices at the sites where it now remains. The population at Tongalong Ridge is in Conservation Zone 1 within Barmah State Forest, and the Mannions Yard and McConnachie's Ridge populations are in Barmah State Park. Reservation status means that these areas are available for cattle grazing but not timber production. The population west of Yielima Pre-emptive Right is in Barmah State Forest, where both timber harvesting and cattle grazing are permitted.

The populations at Nathalia, Strathallan, Rochester and Shelford are particularly vulnerable to destruction because of their location on small parcels of land managed by a number of authorities and private individuals. The Strathallan site is included in the schedule of conservation areas (category 1) under a management agreement between

DCE and V/Line. Planning scheme amendment S16 under the *Planning and Environment Act 1987* (native vegetation retention controls) can protect native vegetation on these sites, but is dependent on public cooperation for success.

In its final recommendations, the Scientific Advisory Committee determined that the Small Psoralea is:

- is in a demonstrable state of decline which is likely to result in extinction; and
- significantly prone to future threats which are likely to result in extinction.

Major Conservation Objectives

- To increase the number of existing plants to at least 500 at each site, and maintain the populations at Tongalong Ridge and Manions Yards at above 5000 plants each.
- To maintain the integrity of the species natural habitat (where it remains fairly intact).
- To maintain the range of genetic variation within the species throughout the state.
- To determine the effects of cattle grazing and weed competition on Small Psoralea, in order to make effective management decisions.
- To locate and protect additional populations of Small Psoralea.

Management Issues

Ecological Issues Specific to the Taxon

Characteristics of the species: Flooding is a major environmental factor in the life cycle of the species. Flooding appears to be involved in successful regeneration from seed (Scarlett 1986). Dispersal of Small Psoralea may rely on flood waters to transport seed pods (N. Scarlett pers. comm.), which is presumably how the species became established at artificial sites at Rochester and Strathallan. The position of the species in ecotonal areas at Barmah suggests there is an optimum depth and duration of inundation for the species.

The plant has a very thick, deep perennial root-stock, which allows it to continue growing and flowering successfully over summer (Scarlett 1986). The top growth dies back over winter and sprouts again in spring. It is possible that it may fail to re-emerge if there has been no winter flood (N. Scarlett pers. comm.).

The exception to this apparent ecological requirement for flooding appears to be the population near Shelford, where the site is rocky on the surface, and appears dry for much of the year.

At the sites south of the Great Dividing Range, the species has a history of burning at irregular intervals. This may aid the survival of Small Psoralea by reducing competition from grasses.

Threatening Processes: The major management issues for Small Psoralea in the Barmah Forest are related to cattle, which graze and trample the species, and spread weeds. The grazing pressure on the species and the concentration of stock is unpredictable at any location or in any season. During late winter/early spring as the flood waters recede palatable native grasses, such as wallaby grasses, attract cattle onto the ridges. During summer, when Small Psoralea is actively growing and

other perennial plants on the ridges have died back, the Moira Grass (*Pseudoraphis spinescens*) plains and extensive River Red Gum areas provide abundant food but stock may still be present on the ridges. It must be noted that in 1991 Barmah Forest experienced extensive flooding, which may account for the large numbers of Small Psoralea recorded and the plentiful supply of other species suitable for cattle grazing.

In seasons where conditions are drier there may be a decrease in the abundance of Small Psoralea and other species, thus placing heavy grazing pressure on Small Psoralea which remains green throughout the summer. The tearing action employed by cattle in grazing is more detrimental to perennials such as Small Psoralea than the scissor action of native herbivores. Although the soils on the ridges may not be as susceptible to pugging as those of the Moira Grass plains, the trampling damage under water-logged conditions may still be severe.

It is difficult to assess the effects on Small Psoralea of competition from weeds. The weed species occurring with Small Psoralea on the box ridges are abundant but appear to fill separate ecological niches; that is, these annual grasses have died back while Small Psoralea is green and actively growing. However, Small Psoralea was absent from those ridges surveyed that are dominated by Paterson's Curse (*Echium plantagineum*).

Where timber harvesting occurs, potentially detrimental effects on the species may result from the use of box ridges for log landings and sleeper hewing of timber. Rabbit grazing is a minor factor. The effect of changed flood regimes in Barmah Forest over the past 100 years on the survival of the species is unknown.

The populations at Nathalia appear to have been smothered by dense weed growth, especially Great Brome (*Bromus diandrus*). The security of the five remaining plants is doubtful as the fence is dilapidated and may be replaced. Exemptions granted under the Nathalia Planning Scheme to the native vegetation retention controls would entitle the landholder to clear the line to construct a new fence. Current threats to the population on the Strathallan rail reserve are weed competition, herbicide drift from spraying the rail line edges, and perhaps rabbit grazing. Future threats to the species are soil disturbance associated with railway works, heavy grazing in drought years, and frequent summer fuel reduction burns or slashing, which will prevent seed set.

At the Rochester site regular mowing is the major threat to Small Psoralea. This activity destroys individual plants by smothering them with debris, and prevents seed set when carried out in spring and summer. Weed competition and perhaps rabbit grazing are additional problems. Soil disturbance and herbicide use are potential threats.

The Inverleigh populations have been destroyed by regular slashing in spring, and by severe disturbance from utility works. The previous fuel reduction regime of infrequent burning appeared to have had little detrimental effect on the species.

Threats to the population near Shelford are related to loss of habitat. Incremental road widening over many years has

greatly reduced the width of the strip of remnant grassland. Future threats are posed by changes to the irregular burning regime now carried out. If this method of fuel reduction was replaced by yearly burns, by herbicide use, or by ploughing, the species would rapidly decline. Weeds, both annual and perennial, may become a problem.

Inadequate knowledge of the species: Effective management of Small Psoralea requires research into the following areas:

- The individual and combined effects of grazing by cattle, rabbits and kangaroos on the species.
- The effects of weeds on Small Psoralea, and the response of weeds in the absence of cattle and/or rabbit grazing.
- The optimum flood regime for the successful regeneration of the species.
- The potential location of other populations on box ridges in Barmah Forest, along the Campaspe River and elsewhere.
- The success of the planting of Small Psoralea seedlings at Ulupna Island on the Murray River in the late 1970s and early 1980s.
- The optimum timing and frequency of burning.

Wider Conservation Issues

Research into the effects of various grazing animals on Small Psoralea through the use of exclusion plots has the potential to yield information on the response to these pressures of other species found in the same habitat. The box ridges where Small Psoralea occurs comprise 3.5 % of Barmah Forest's total area, but support a third of its flora (Frood 1988). They are remnants of vegetation types once widespread in the northern plains, and now threatened state wide. The Proposed Barmah Management Plan (CFL 1990) recommends as a high priority a research project, with part of its objectives being to assess the effects of cattle grazing on native plants and weeds. Management action to protect Small Psoralea will be coordinated with the management plan to be prepared for the Shelford-Mt Mercer roadside, which is aimed at protecting this very significant grassland remnant. The road reserve supports a number of significant species, including Small Milkwort (*Comesperma polygaloides*) and Clover Glycine (*Glycine latrobeana*), both classified as vulnerable by Gullan *et al.* (1990), and Slaty Leek-orchid (*Prasophyllum frenchii*) and Spurred Spear-grass (*Stipa gibbosa*), both rare (Gullan *et al.* 1990). The management plan is a joint project between Habitat Works (funded by Australian National Parks and Wildlife Endangered Species Unit), the Shire of Leigh and the Shelford brigade of the Country Fire Authority. DCE will have input into this plan. Public awareness and appreciation of native grasslands will be raised through the liaison process in protecting Small Psoralea on the Shelford-Mt Mercer roadside.

Social and Economic Issues

In order to secure protection of this species, several social and economic issues must be addressed. However, the impacts of the activities outlined in this Action Statement on people or organisations will be minor. As most of the sites are small and isolated, they are particularly subject to activities such as slashing, herbicide use, utility works, road widening and changed burning regimes. In

addition, responsibility for management of these sites is spread over several authorities, which could result in the inadvertent destruction of one population. DCE needs to work cooperatively with V/Line, Rochester Golf Club, Shire of Leigh and Shelford CFA to ensure protection of the species.

Cattle agistment in Barmah Forest is supported by local land-holders as a fuel reduction measure for fire protection and some farmers are dependent on access to the forest for the continued viability of their enterprise. The annual cattle muster is a district social event. Any change to the access for graziers will need to be handled sensitively and cooperatively with the Barmah Cattleman's Association and the Aboriginal community.

Management Action

Previous Management Action

A plan for the management of Small Psoralea in the rail reserve at Strathallan, in line with the Railway Reserves Management Agreement between DCE and V/line (Category 1), was proposed by the DCE Benalla Region in 1989. This proposal to carry out fencing, signposting, weed control and fuel reduction was only partly implemented due to lack of funds. A fuel reduction burn was carried out in May 1990, but due to the lack of monitoring, the responses of Small Psoralea and weeds are unknown. Scarlett (1986) recorded several management actions at Rochester carried out between the late 1970s and early 1980s. Prior to construction of the golf course a small part of the population was fenced by the Rochester Jockeys Club. Seed was collected and is now stored at the National Botanic Gardens, Canberra. Seedlings of the Rochester population were planted in the Ulupna Island Flora and Fauna Reserve on the Murray River, but there has been no subsequent monitoring to ascertain the success of this re-establishment program.

Recent management negotiations (November 1991) have taken place between the Flora and Fauna Guarantee Officer at Bendigo Region and the Fairway Committee of the Rochester golf course. The Fairway Committee, which is responsible for maintenance of the golf course, is likely to agree to fence the densest part of the population and to avoid mowing this area in spring and summer.

Negotiations between Scarlett and V/Line concerning the management of the Inverleigh populations were unsuccessful, and all have been destroyed except one plant. Mark Trengrove, an indigenous plant grower at Geelong, has seed collected from the Inverleigh population. Site visits by Habitat Works and the Shelford CFA have resulted in verbal agreement by the brigade to avoid burning the stretch of roadside supporting Small Psoralea until late February, at a minimum interval of three years. This will ensure that the plants are able to flower and set seed successfully. The Shire of Leigh has received a 'Save the Bush' grant to erect signs and prepare a management plan for the roadside.

Intended Management Actions

All Sites

Aim: To assess whether Small Psoralea is declining or increasing at known sites.

Method: Visit all sites once a year in October/ November and count the numbers of Small Psoralea present where there are less than 1000 plants, and estimate numbers of larger populations.

All Regions

Aim: To locate any populations not yet recorded so that they may be protected.

Method: Search for potential sites along the Campaspe River, on other box ridges in Barmah Forest, and grassland remnants south of the Great Dividing Range, especially between Geelong and Ballarat. Flora Branch to advise regions of any new records every six months, through Flora and Fauna Guarantee Officers.

Barmah Forest

Aim: To assess the impacts of different grazing animals (cattle, rabbits and kangaroos) on suppression of Small Psoralea and weed species.

Method: Erect exclusion plots; one plot excluding both rabbits and cattle, another plot excluding cattle only, and a control plot allowing all three grazing animals. These plots will be visited every year in late spring for five years to record the abundance of Small Psoralea and weed species. Data will be recorded from a number of representative sub-plots within each of the three large plots. Tongalong Ridge will be the location for these plots because the ridge supports the largest population of the species. At the conclusion of the data collection phase a report will be written and appropriate management actions implemented.

Aim: To ascertain the success of the planting of Small Psoralea on Ulupna Island.

Method: Liaise with the Botany Department, La Trobe University, and search for the species on site, recording the number of plants found.

Aim: To protect the species from disturbance associated with timber production.

Method: Map the population west of Yielima Pre-emptive Right as input to the Mid Murray Forest Management Plan currently being prepared. Timber harvesting and associated activities will be excluded from this ridge.

Strathallen

Aim: To implement the DCE agreement with V/Line to protect the population.

Method: Erect signs and fences to indicate the presence of the species. Liaise with railway maintenance staff to prevent damage by earth moving, herbicide use, burning or slashing. DCE will carry out fuel reduction burns in autumn (at three year intervals), and monitoring of the numbers of Small Psoralea and the cover of weeds every spring.

Rochester

Aim: To protect plants from inappropriate mowing regimes, and excessive weed competition.

Method: Assist golf course owners in fencing and sign-posting the area designated by Flora and Fauna Guarantee Officer,

Bendigo Region. Gain support for these actions through press releases in the local media. Continue yearly liaison with owners and Fairway Maintenance Committee to ensure plants are only mown in autumn after seed release.

Inverleigh

Aim: To re-establish Small Psoralea on the rail reserve and encourage regeneration of soil-stored seed.

Method: Arrange agreement with V/Line for DCE to manage the maintenance of this site. DCE to carry out fuel reduction burns every three years in autumn. Plant Small Psoralea seedlings, and hand weed to encourage regeneration from soil stored seed. Erect fence and signs to prevent further damage.

Aim: To establish Small Psoralea in the Inverleigh Common Flora and Fauna Reserve. The species has not been recorded for this reserve, but may be the only nearby secure public land where the Inverleigh provenance of the species can be introduced.

Method: Propagation of seedlings from seeds of the Inverleigh population. These will be planted out in autumn 1993. The location for replanting will be a low-lying area in the dry gully in the Common. This small site (2 m x 30 m) holds water for several days or weeks during the winter and remains damp for some time afterwards. Various positions in this micro-environment will be planted to discover the optimum water conditions required. The Friends of Inverleigh Common group are willing to monitor the progress of the planting as part of their activities in the reserve. DCE will erect a fence to protect the plants from rabbit and kangaroo grazing.

Shelford- Mt Mercer

Aim: To protect the population from disturbance and inappropriate management regimes.

Method: DCE will liaise with the Shire of Leigh, local CFA brigades, local landowners and Habitat Works in the preparation of the management plan for the roadside. The Shelford CFA will be encouraged to apply for a small DCE grant (e.g. 'Adopt-a-Plant' scheme) to carry out appropriate burning of the Small Psoralea population on the roadside. Shire of Leigh to erect identification markers at Small Psoralea site to prevent accidental damage by machinery. Seed collection by Habitat Works for re-establishment in the event of the population being destroyed.

Deer Park

A management plan is being prepared by DCE for the site, which is of archeological, zoological and botanical significance. Management of Small Psoralea will be included in this plan.

Legislative Powers Operating

Legislation

Conservation Forests and Lands Act 1987

Crown Land (Reserves) Act 1978

Flora and Fauna Guarantee Act 1988

Forests Act 1958

National Parks Act 1975

Vermin and Noxious Weeds Act 1958

Amendment S16, Planning and Environment Act 1987

Licence/Permit Conditions

Permits for the collection of Small Psoralea seed will only be given for work which is in accordance with the conservation objectives.

Consultation and Community Participation

Community consultation and education will be important ongoing tasks for regional Flora and Fauna Guarantee Officers. Local naturalists will be encouraged to continue informal monitoring of known populations and searching for new populations in the Benalla Region.

The Rochester Golf Course Fairway Committee has agreed to avoid mowing the population of Small Psoralea, and liaison with this voluntary group will continue. The Friends of Inverleigh Common Group are willing to establish and protect a population of Small Psoralea in the reserve.

Habitat Works and DCE Ballarat will continue liaison with the Shire of Leigh and Shelford CFA to ensure appropriate management of the Shelford-Mt Mercer roadside.

Implementation, Evaluation and Review

The Manager, Flora Branch, in consultation with Benalla, Bendigo, Geelong and Ballarat Regions, will coordinate the implementation of action proposals and evaluate their effectiveness in achieving conservation aims.

Contacts

Management

FFG Officer, DCE, Shepparton.

FFG Officer, DCE, Bendigo.

FFG Officer, DCE, Geelong.

FFG Officer, DCE, Ballarat.

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Biology

Flora Branch, DCE, Kew.

Neville Scarlett, Botany Department, La Trobe University.

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Further information

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

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