

Flora & Fauna Guarantee Action Statement

#72

This Action Statement was first published in 1996 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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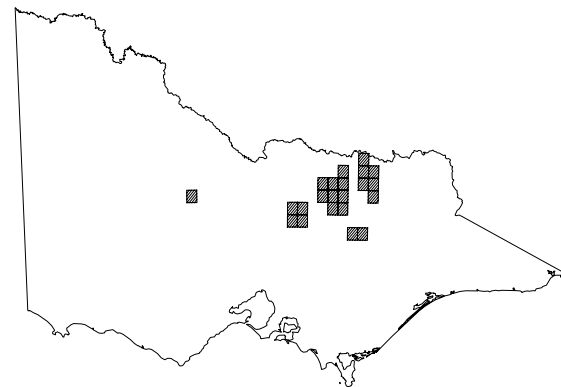
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Narrow Goodenia *Goodenia macbarronii*



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Distribution in Victoria (DSE 2002)

Description and Distribution

The Narrow Goodenia (*Goodenia macbarronii* Carolin 1990), is an erect herbaceous plant, with a short tap-root and well developed secondary root system. It grows either as an annual, expiring after one flowering, or continues to live perennially (most of the populations would fall in the latter category).

Plants can reach 40 cm in height with the flower stem greater than twice the leaf length. The mostly basal leaves are narrow-obovate to linear-oblongate, 5-11 cm long by 2-6 mm wide, hairless or with scattered simple hairs, thick with a few coarse teeth on the margin. Several rosettes may be linked by short oblique rhizomes (underground stems). The yellow flowers are arranged in terminal clusters and have linear bracts. A distinguishing feature of this species is the square indusium (pollen-cup of the style) which is long, not folded and brown to purple towards the top. Seeds are biconvex, yellow-brown and

have a mucous-like coating.

The flowering period is generally from October to March, but seems to vary across the species' range; Victorian populations have been observed in full flower into April. Soil moisture undoubtedly plays a part in its flowering strategy. B. Devany (pers. comm.) noted that a nearby spring had dried in March the plants had ceased to flower, however on visiting the site several weeks later, it was very wet and the plants had begun to flower again.

The Narrow Goodenia is found on the inland foothills of the Great Dividing Range across eastern Australia, on sandy to clay/silt soils. It ranges from the Darling Downs in Queensland through to the Western Plains, Western Slopes and Tablelands of New South Wales and into North East Victoria, where it is usually found north of the Divide on western to northern slopes.

In Victoria, to date, there are nine known major locations, with a total of twenty-four sites, comprising some thirty-two populations (see Table 1).

Table 1 Confirmed populations: summary of size, location and land status.

Area	Site	Land Status	Size*	Area	Site	Land Status	Size*
BEECHWORTH	1	Private	?	EUROA (cont.)	4	Private	?
	2	Roadside	?		5	Private	?
CHESNEY VALE	1	Private	100s		6	?	?
	2	Road Reserve	100	GLENROWAN	1	Uncommitted Crown Land	1000
	3	Private	100s		2	Bushland Reserve	1000
	4	Private	100,000	GRETA WEST	1	Road Reserve	?
	5	Road Reserve	<100	MOUNT PILOT	1	Multi-purpose Park	100s
	6	Road Reserve	1000s	TENERIFFE	1	Road Reserve	100
CHILTERN***	1	State Park	100s	WARBY RANGE	1	Bushland Reserve	?**
EUROA	1	Private	1000s		2	Bushland Reserve	?
	2	Shire Property	1000s		3	Private	1000
	3	Private	100s		4	State Park	10,000

*The approximate number of rosettes as an order of magnitude. This is only an indication of the size of the largest population at each site.

**The question marks indicates that these populations have not had an estimate made for the number of rosettes.

***Chiltern site location is uncertain, the record is a specimen at the National Herbarium of Victoria.

Nine of the sites are on private land, one on shire owned land, five sites are on road reserves and six occur on public land (with two sites of other land status). Twenty-two populations are in natural habitat and seven are found in situations which appear to be an artefact of previous land management.

The Narrow Goodenia occurs in spring-soaks, alluvial fans of drainage lines and areas which are at least moist (if not wet) year round. The latter includes sites which are an artefact of human disturbance, such as roadside drains and dams. The majority of recorded populations in Victoria occur on granite or granodiorite parent rock and associated colluvial areas, except for: a site at Drysdale Rd, near Euroa, where the populations are on the northern outwash slopes of the metamorphic Creighton Hills.

Conservation Status

Current Status

Status in Australia

ANZECC (1993) Vulnerable

Status in Victoria

CNR (1994) Vulnerable
SAC (1991) Threatened

The Narrow Goodenia is listed as a threatened taxon in Schedule 2 of the *Flora and Fauna Guarantee Act 1988*.

Reasons for Conservation Status

The Narrow Goodenia occurs only in small, restricted and isolated populations due to its specific habitat requirements. Its occurrence in Victoria represents the

south west extreme of the species' distribution. Few populations are on public land which is managed primarily for conservation purposes.

When the Narrow Goodenia was accepted for listing under the FFG Act in 1991, the species was known from five sites in north central/east Victoria and was considered very rare in terms of abundance. In spite of further populations being discovered since FFG listing, all populations remain vulnerable to one or more of the threats described below.

The destruction and disturbance of habitat may have resulted through agricultural practices including; clearing of native vegetation, creation of dams in foothill gullies and overstocking. Removal of native vegetation around springs or soaks is likely to alter the water regime of the site. All sites are vulnerable to a change in hydrology and increased weed invasion, some are threatened by stock causing soil destruction and roadside grading.

The populations are highly localised to these wet sites and often the Narrow Goodenia is the predominant vascular plant present. The area covered by the populations is small, usually less than 0.1 hectares and often a matter of a few square metres. The number of rosettes at a site can vary from a few per square metre to in the order of one hundred. The number of genetically distinct plants is difficult to determine as several rosettes may be linked by the underground stems.

In its final recommendations, the Scientific Advisory Committee (1991) determined that the Narrow Goodenia is:

- significantly prone to future threats which are likely to result in extinction; and
- very rare in terms of abundance or distribution.

Major Conservation Objectives

The major conservation objectives are to:

- Maintain existing populations at current levels and enhance habitat by managing threats to their survival, with emphasis on significant sites.
- Through incentives and co-operative management with land holders endeavour to secure at least six key sites (i.e. better representatives) on non-NRE managed land.
- Endeavour to locate at least three sites on secure public land within five years.

These actions should change the status of Gaping Leek-orchid from Endangered in Australia and Victoria, to Vulnerable in Australia and Victoria, by December 2003.

Management Issues

Ecological Issues Specific to the Taxon

The Narrow Goodenia has only relatively recently been described (it was previously known as *Goodenia* sp. aff. *gracilis*) and difficulty in identifying this species has led to some confusion. It is likely that it has been mis-identified on occasion as one of two similar species found in the North East of Victoria in similar damp habitats, namely *G. gracilis* (Slender Goodenia) and *G. humilis* (Swamp Goodenia).

Inadequate Knowledge

Little is known of the reproduction of the Narrow Goodenia, and therefore its survival abilities, which limits the assessment of an individual population's viability. Whilst the species does expand vegetatively by short rhizomes it also puts a long and continuous effort into flowering. There is a critical need to understand aspects of its reproductive biology such as the rate and extent of seed dispersal and seedling recruitment.

The Narrow Goodenia's annual or perennial nature may reflect its response to water availability and climatic variation. Ability to withstand minor hydrological change is not known, although Cameron and Moorrees (1992) surmise that the Narrow Goodenia would be less capable of surviving moisture fluctuations than other wetland species which are extensively linked by rhizomes and have the ability to redistribute resources within the colony. Further information on the impacts of hydrological and climatic variation on the Narrow Goodenia would be required in order to determine meaningful boundaries for critical habitat, and for management actions in general. While groups of genetically identical plants may result from vegetative reproduction, it is likely that each population includes a number of genetically different plants. Research is needed to assess the significance of populations in terms of inherent genetic variation. This information would be important for Critical Habitat determination.

Potentially Threatening Processes

The Narrow Goodenia has a specific habitat requirement of seasonally saturated soils and would presumably have little tolerance to hydrological change which precluded seasonal inundation. It is therefore likely to be susceptible to any

action or land management practice which affects the hydrology of the site. This may range from small on-site alterations to the clearing of a part of the catchment above. The degree of environmental weed invasion at Narrow Goodenia sites varies. Survey revealed that sites on private land are usually more weed infested. Accelerated invasion and competition by exotic species, particularly vigorous plants such as *Holcus lanatus* (Yorkshire Fog Grass), *Hypochoeris radicata* (Cat's Ear), *Paspalum dilatatum* (Paspalum), *Anthoxanthum odoratum* (Sweet Vernal-Grass) and *Phalaris aquatica* (Phalaris), results in a decline in the integrity of the native vegetation community and threatens the existence of the Narrow Goodenia through competition for space, light and available water.

Trampling by hooved animals, compaction and disturbance of soil is common at sites on private land and is contributing to the decline of the vegetation community as a whole. Feral rabbits may have an adverse impact by browsing on the Narrow Goodenia.

Urbanisation of habitat, i.e. small block subdivisions, and pressure for dam construction are threats of increasing likelihood which are particular to certain areas, e.g. Wooragee - Beechworth area and around the Warby Range.

Roadsides

Populations occurring in these situations are extremely vulnerable to habitat destruction by the actions of road maintenance. Some of these may exist as a result of road works and appear to be opportunistic in nature rather than occurring there naturally. Therefore management will depend on how significant these populations are deemed to be after survey and management priorities have been effected. Collating the effects of disturbance at these sites may provide an insight into population establishment.

Fire

Knowledge of the impact of fire on the Narrow Goodenia would be of importance in the management of its habitat. Reduction of exotic species, in certain sites, by burning could be a very useful tool if carried out at the appropriate time of year, given that there were limited deleterious effects to the Narrow Goodenia population.

Wider Conservation Issues

Conservation of other Plant Species

Conservation measures to protect the Narrow Goodenia will also benefit the (presumably vulnerable) vegetation community (Spring-soak Herblands, Cameron 1992), in which it occurs. Other plant species which will benefit: e.g. in the Euroa area, regionally significant species are; *Centrolepis aristata* (Pointed Centrolepis), *Danthonia auriculata* (Lobed Wallaby Grass), *Drosera glanduligera* (Scarlet Sundew), *Hypericum japonicum* (Matted St John's Wort), and *Utricularia dichotoma* (Purple Bladderwort). On a private property in the Chiltern/ Beechworth area indirect conservation has occurred in the protection of *Diuris punctata* and, if the Narrow Goodenia is confirmed, the same has occurred for some *Eucalyptus cadens* sites. The old Recreation Reserve at Glenrowan also has *Diuris punctata* which would also benefit from protection.

Land Status

Opportunities exist to alter the status of a tract of crown land to enhance conservation prospects, e.g. rezoning of land by a shire to protect a threatened species. This has the potential to be applied to uncommitted crown land.

Parks and Reserves

The conservation of this species should be considered in management plans being prepared for Parks and reserves and existing management plans should be amended. The conservation of the Narrow Goodenia will have some bearing on the management of certain areas of the Warby Range State Park and Reef Hills Regional Park (if the population is confirmed), but will have no detrimental impacts on other species or vegetation communities.

Private Land

Springs, soaks and perennially damp areas which occur in an environment which is dry for the summer period are prone to weed invasion and destruction, through pugging and compaction, by hooved animals. Sheet and gully erosion is a major problem on foothill granite land where the native vegetation has been cleared. Fencing and ongoing weed control to restore the area around the sites at which the Narrow Goodenia occurs, will be a positive step to conserving the native vegetation community and reducing the chance of erosion initiating. Conservation of springs will ensure that water quality and quantity is maintained. However, in the absence of grazing, exotic weeds would be able to grow unchecked and may dominate the site.

Aerial spraying of weedicide and subsequent seeding with exotic perennial pasture species could well pose a threat to Narrow Goodenia populations (and other native species) if indiscriminant.

Cultivation

The Narrow Goodenia has the potential to be propagated and cultivated as a wet area, prostrate, flowering ornamental.

Rare or threatened plants at the current site and at potential re-establishment sites include: Purple Diuris (*Diuris punctata*), Diuris (possibly *D. cuneata*), Dwarf Milkwort (*Polygala japonica*) and Austral Moonwort (*Botrychium australe*). The first three plants would benefit from the works proposed to protect Gaping Leek-orchid. The effect upon Austral Moonwort is unknown.

Tree decline is an issue on the Gippsland Plains, and maintaining the native grassland habitat of the Gaping Leek-orchid requires removing regenerating trees and shrubs. However, the areas to be cleared are very small. The proposed actions will increase our knowledge of the genus. At least 15 other rare or threatened leek-orchid species are known from Victoria (Gullan *et al.* 1990, Jones 1991).

Social and Economic Issues

Euroa Tip

There is one significant social and economic issue associated with the conservation of the Narrow Goodenia. This has resulted from the discovery of the Narrow Goodenia (and a new subspecies *Hibbertia humifusa* ssp. *erigens*) at the proposed Shire of Euroa tip site on Drysdale Road, Creighton Hills. The 65 hectare property was purchased by the local Shire in 1990 with the intention of developing a landfill tip site. A works approval for this development has been granted by the Environment Protection Authority (EPA). This was appealed by the Euroa Environment Group and was to become a subject of an AAT hearing. However, with the recent Shire amalgamation the new Commissioner is seeking an alternative site and the hearing has been postponed indefinitely.

Private Landholders

With a few exceptions, the protection of Narrow Goodenia sites will result in a negligible loss of productive farm land. Longer term benefits of land management planning, i.e. development of a Property Management Plan which also incorporates the protection of Narrow Goodenia sites, may extend from associated soil and water conservation measures. Landowners have reacted positively to initial approaches regarding habitat management, but they do not wish to bear the entire costs of the species' protection.

Management strategies to minimise the need for additional costs in weed control need to be developed, these may include grazing at certain suitable times of the year.

Management Action

Previous Management Actions

Prior to listing under the *Flora and Fauna Guarantee Act* there was little management action to conserve this species, however since 1991 there have been some positive developments.

An NRE-approved Management Plan was prepared for the flora and fauna of the proposed rubbish tip at Drysdale Road, Euroa (Miller *et al.* 1992). One of the main aims of vegetation management in the plan is to conserve and protect the rare and significant species.

The Euroa Environment Group has taken an active interest in the conservation of the proposed tip site and adjacent remnant bushland at Creighton Hills. Concern for the Narrow Goodenia has prompted further surveys and resulted in the discovery of several new populations.

Only one population, on private land, has been indirectly managed as a result of fencing erected around a gully for revegetation of a potential erosion area. On the same property the landowners plan to fence out two other areas containing Narrow Goodenia populations.

Intended Management Action

Taxonomy

- Determine the range of morphological variation, and compare with specimens of Swamp Goodenia and clarify status of unusual specimens collected at the drier sites. This is the responsibility of a taxonomic institution (e.g. Royal Botanic Gardens or a University).

Survey, Habitat Characterisation and Threat Assessment

- Search sites at which Slender Goodenia or Swamp Goodenia have previously been recorded in North-east Victoria as they may have been mis-identified. Search for new populations of the Narrow Goodenia in areas of typical habitat in North-east Victoria. Involve community groups in survey work under the Botanic Guardians scheme.
- Assess habitat and threats for each population by completing a population monitoring form - VROTPOP, Flora and Fauna Branch, NRE, by 1997).
- Map all populations for public and private land. Distinguish between natural sites and those sites which are an artefact of previous land management activities.
- Record information on appropriate database.

Planning

- Rate known and any new populations on their significance and importance (according to method as determined by Flora and Fauna Branch, NRE). This will enable effective use of resources.
- Formulate prescriptions for management of populations and their habitat on public land. Incorporate conservation considerations for the Narrow Goodenia into existing and future management plans for State and Regional Parks (North East Region).
- Review status of some crown land (e.g. uncommitted crown land, Bushland Reserves) to enhance opportunities for conservation management, under responsibilities of Section 4 of the *Flora and Fauna Guarantee Act 1988*.
- Erect signs for the protection of habitat on Road Reserves (North East Region).

Routine Monitoring

- Monitor selected populations annually to determine the change of number/size with time and hydrological variation.
- Involve community groups in monitoring under the Botanic Guardians scheme

Effect of Stock Removal

- In liaison with land owners monitor exotic weed species on sites from which grazing has been excluded, and note any increase in cover and/or abundance. Control these species as necessary (see Habitat Management).

Training and Community Education

- Make available information (including a table of distinguishing characteristics for similar *Goodenia* species) on identifying Narrow Goodenia sites and provide advice on their protection to NRE extension officers, officers from shires and authorities and any interested parties (North East Region).
- Prepare a brochure with recommendations about protecting sites and emphasising beneficial effects for soil and water conservation, for distribution by NRE extension officers.

Extension

- Liaise with landholders and inform them of the threats to this species, highlighting the importance of managing site hydrology. Provide advice on weed control where necessary and practicable.
- Promote property management planning in these areas that accommodates Narrow Goodenia requirements.
- Liaise with managing authorities for public land to achieve conservation goals. Provide location of populations in suitable mapping format.
- Liaise with Catchment Management and Sustainable Agriculture staff to prevent indiscriminate aerial spraying of weedicide and subsequent seeding with exotic, perennial pasture species on Narrow Goodenia sites, and other areas of native vegetation.

Habitat Management

- Encourage habitat protection on private land and assist in securing financial assistance and support for fencing and weed control. Involve Landcare groups in habitat protection and weed control.
- Develop low-cost management strategies for weed control on private land, e.g. use of restricted grazing or burning at appropriate times of year.
- Repair fences on any public reserves where necessary to prevent stock straying from adjacent private land (North East Region).

Other Desirable Management Actions

Critical Habitat Determination

- Determine and map areas which represent critical habitat for this species, if this is an appropriate action following Planning. (Flora and Fauna Branch, 1997).

Research

(Note: These could be developed as projects for university students)

- Research the biology and reproductive strategies of Narrow Goodenia.
- Determine the genetic variation within and between populations.
- Evaluate the effect of cattle/sheep disturbance by exclusion plots, or monitor the effect of removal of grazing, e.g. increased weed competition may result from grazing exclusion.
- Assess the impact of ecological burning/ grazing at selected sites where removal of grazing has resulted in excessive exotic species growth.

Legislative Powers Operating

Legislation

Catchment and Land Protection Act 1994

Conservation, Forests and Land Act 1987

Crown Land (Reserves) Act 1978

Fences Act 1968

Flora and Fauna Guarantee Act 1988

National Parks Act 1975

National Parks (Amendment) Act 1989

Soil Conservation and Land Utilization Act 1958.

Licence/Permit Conditions

Permits for the collection of Narrow Goodenia seed and or vegetative material will only be given for work which is in accordance with the conservation objectives and prescribed management actions.

Consultation and Community Participation

Local field naturalists will be actively encouraged to participate in further survey and monitoring activities under the Botanic Guardians Scheme.

NRE Benalla will liaise with the Shire of Euroa to manage the bushland site at Creighton Hills for its flora and fauna values and monitor implementation of the management plan.

Municipalities with the Narrow Goodenia on roadside localities will be consulted re: optimal management.

Implementation, Evaluation and Review

The Manager, NRE North East Region will coordinate the implementation of this Action Statement. Primary responsibility for implementation and assessment of the effectiveness of the management actions on an annual basis lies with the Flora and Fauna Coordinators at Benalla and Wodonga. Progress in achieving the conservation aims will be evaluated and reviewed by NRE in 1997.

Contacts

Management

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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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