

# Flora & Fauna Guarantee Action Statement

#56

This Action Statement was first published in 1994 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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Department of  
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Published by the  
Department  
of Sustainability and  
Environment, Victoria.  
8 Nicholson Street,  
East Melbourne,  
Victoria 3002 Australia

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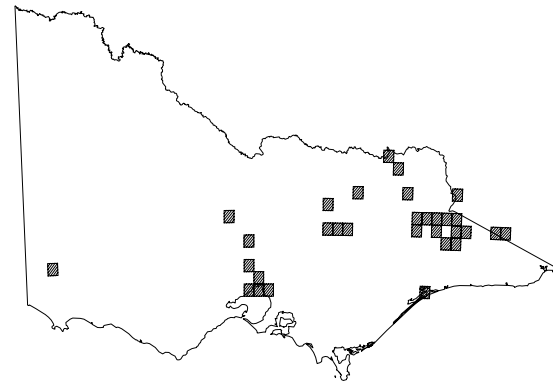
ISSN 1448-9902

## Austral Toad Flax

### *Thesium australe*



Austral Toad Flax (*Thesium australe*)  
Stem (left), flower and leaf (right)



Distribution in Victoria (DSE 2002)

### Description and Distribution

Austral Toad-flax (*Thesium australe* R.Br.) is a perennial pale green or yellow-green herb with 1-30 branched stems up to 60 cm long. The leaves are sessile, linear and acute, mostly 1-3 cm long with a decurrent midrib. The lowest leaves are scale-like. The flowers are solitary in the leaf axils, borne on a peduncle (1-3 mm long) which is united with the leaf bases. Two opposite, linear bracteoles, 2-3 mm long occur at the base of the very short pedicel. The flower receptacle is cupular-globular, 1 mm long. The four or five tepals (perianth parts) are oblong, finely keeled and united at the base. The tepals are green abaxially and white adaxially, including the tepal margins; the apices are incurved. The stamens are inserted on the tepals. The inferior ovary has a 1 mm long style with a globular stigma three ovules). The fruit is a globose, slightly fleshy drupe 2 mm in diameter, crowned with the persistent tepals. The dry drupe has a markedly reticulate-striate surface (after Hewson &

George 1986).

The Austral Toad-flax is a member of the Santalaceae (Sandalwood Family) and, like many members of this genus, is hemiparasitic on the roots of other plants, notably *Themeda triandra* (Kangaroo Grass). Collections in Australian herbaria indicate that Austral Toad-flax was widespread in eastern Australia, from the Bunya Mountains in Queensland south to eastern Tasmania (Griffith 1991). It is not currently known from Tasmania, but was collected there by Robert Brown in the early 1800s.

The Austral Toad-flax has a wide ecological tolerance having been recorded from subtropical, temperate and sub-alpine climates, and on soils derived from sedimentary, igneous and metamorphic rocks as well as recent alluvium. However, it is largely confined to grasslands, grassy woodlands or sub-alpine grassy heathlands. While Austral Toad-flax is usually associated with Kangaroo Grass and (less frequently) with *Poa* spp., it will grow with other hosts, at least in the glasshouse.

**Table 1: Currently known Austral Toad-flax populations in Victoria (all in Gippsland area)**

Site	Minor Grid	Area	Land Status	Last Sighting	No. Plants	Comments
First Emu Plain	V53	12 ha	Alpine Nat. Park (Cobberas-Tingaringy)	1990	50	No plants seen February 1991 (D. Tonkinson pers. comm.)
Rocky Creek	V53	800m2	Alpine Nat. Park (Cobberas-Tingaringy)	1985	>1000	
Rocky Plain	V53	16 ha	Alpine Nat. Park (Cobberas-Tingaringy)	1989	1	110 in May 1995 (Archer 1997)
Limestone Creek	V52	800m2 (min)	Alpine Nat. Park (Cobberas-Tingaringy)	1990	50	No plants seen February 1991 (D. Tonkinson pers. comm.)
Green Hills, Gillingall Station	W16	24 ha	Private property	1994	>2000	>2000 in 1990, scattered widely; >500 in 1991

The Austral Toad-flax was once present in Victoria from Wando Vale in the west northwards to the New South Wales border. Historical collections are mainly from south of the Great Divide, but the species was once present on the upper Goulburn, Ovens and Murray Rivers.

Despite extensive searches by botanists from La Trobe University, Austral Toad-flax has been found at only five sites in Victoria since 1979 (see Table 1). All sites are confined to areas between 800 m2 and 24 ha.

The localities for two relatively recent, unconfirmed collections from Second Emu Plain and Racecourse Paddock on 'Rockbank' property, have not been searched; these records were not known to La Trobe University before 1990.

It is possible that the 'Racecourse Paddock' record is the same locality as A.C. Beauglehole's 'Mt Hamilton' record. The Lake King Area (W50) was not specifically searched, but Austral Toad-flax was not found on the Gippsland Plains, during searches for other species in grassland remnants between 1979 and 1984.

## Conservation Status

### Current Status

National (Briggs & Leigh 1988)	Endangered
<i>Endangered Species Protection Act 1992</i>	Vulnerable
State (Gullan <i>et al.</i> 1990)	Endangered
SAC (1991)	Threatened

The Austral Toad-flax has been listed as a threatened taxon on Schedule 2 of the *Flora and Fauna Guarantee Act 1988*. Griffith (1991) stated that the national conservation status of Austral Toad-flax has been reassessed as Vulnerable rather than Endangered.

### Reasons for Conservation Status

The Victorian range of Austral Toad-flax has contracted markedly since European settlement. From the early days of colonisation, grasslands and grassy woodlands have been utilised for agriculture. The habitat destruction and fragmentation consequent on such utilisation is responsible for the present threatened status of the Austral Toad-flax. The species is now confined to an area between Limestone Creek and Green Hills (Gillingall) on the Buchan River. A

population derived from the Gillingall population has been reintroduced at Lake Omeo at Benambra. No lowland populations are known to survive.

The contraction in the documented range of Austral Toad-flax is due to heavy grazing and cultivation of grasslands and grassy woodlands in the lowlands of Victoria. Changes in fire regime may also be responsible for the absence of Austral Toad-flax from the native grassland remnants of the lowland plains (Scarlett and Parsons 1982). The absence of Austral Toad-flax from areas with dense shrub and/or tree cover at known sites suggests that the maintenance of open conditions by frequent firing in the long-term may be as important for the survival of Austral Toad-flax as the apparent stimulation of germination by fire mentioned above.

In its final recommendations, the Scientific Advisory Committee (SAC 1991) determined that the Austral Toad-flax is:

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

### Major Conservation Objectives

The major conservation objectives are to:

- Protect, monitor and manage all known populations on public land and to propagate and re-establish Austral Toad-flax populations at three suitable, secure sites on public land over the next five years.
- Protect and manage the Green Hills Gillingall population to ensure appropriate grazing/fire regimes and weed control occurs.

## Management Issues

### Ecological Issues Specific to the Taxon

Research by Archer (1984, 1987) and Leigh & Briggs (1989) indicates that:

- Austral Toad-flax populations are subject to quite extreme fluctuations from year to year.
- Austral Toad-flax is grazed severely by cattle, horses, rabbits, kangaroos and wombats. Grasshoppers also graze it severely, but possibly only when other food sources are limited (Archer 1984).

- Austral Toad-flax is commonly observed to germinate well after fire. However, observations at Green Hills (Gillingall) indicate that adequate regeneration does occur without fire, at least where grassland is lightly grazed by cattle (Scarlett 1987). Similarly, a population of Austral Toad-flax at Glen Allen in southern NSW, which has been grazed only by native herbivores for the past 10 years, appears to be adequately maintained in the absence of fire (G. Earl pers. comm.)
- Archer (1987) also observed high seed germination after the drought of 1983.
- Austral Toad-flax is a short-lived species. Leigh & Briggs (1989) suggest that it is a strict biennial but plants cultivated at La Trobe University lived up to three years from germination. In the field most plants may not live more than two years, which accounts for Leigh & Briggs' observations.

## Wider Conservation Issues

The protection of a number of other rare or threatened species, including Dwarf Milkwort (*Polygala japonica*) and Hairy Anchor Plant (*Discaria pubescens*) will be enhanced as a consequence of protecting Australia Toad-flax. The preferred grazing and burning regime is not likely to adversely affect other species or species composition.

## Social and Economic Issues

There are no major issues because the sites are rather small and are in isolated areas of Victoria where grazing is the main human activity. Only one is on private land. The impacts of requiring any management changes would be small, while the emphasis would be on negotiated solutions. However, past management by graziers has been consistent with protection of the sites which provide some grazing over November-April. Conservation management is currently thought to be compatible with continued grazing, and with burning where this occurs. Blackberry control will enhance the productive and capital value of the sole privately owned property with an Austral Toad-flax site.

A permanent conservation solution is consistent with other management objectives for the sites within the Alpine National Park. A solution is more difficult where private land owners need to pursue an income from the land, and where management priorities or owners may change over the long term. Nevertheless, a range of options can be negotiated with the owner of Green Hills; these include a cooperative agreement, conservation covenant or land purchase (with appropriate grazing then undertaken by agistment or lease).

## Management Action

### Previous Management Action

#### Original Sites

There has been little active management for Austral Toad-flax populations at any public land site. Partial monitoring

was done by Mr Dale Tonkinson (formerly of CNR) in the summers of 1990 and 1991.

The banning of traditional burning-off by grazing licensees may have been involved in the decline of reserved Austral Toad-flax stands. The reappearance of Austral Toad-flax at First Emu Plain in 1990 followed a burn that may have been illegal.

As a result of the 1990 monitoring, it was proposed that an experimental burn followed by monitoring be done at Rocky Plain. This proposal has not yet been carried out, and should now be treated as urgent.

CNR staff have been consulting with the landholder of Green Hills in an effort to determine the most appropriate and effective management of this site.

## Reintroduction Sites

Austral Toad-flax was formerly present in the Benambra area near Lake Omeo. In 1984 La Trobe University Botany Department, with funding from the World Wide Fund for Nature, began work on reestablishing Austral Toad-flax at Lake Omeo. With the permission of the Committee of Management, a 1.6 ha area was fenced from cattle by the then Department of Conservation, Forests and Lands. About half of this enclosure is good-quality *Themeda* remnant grassland. In 1984 and 1985 plants dug from the Gillingall population were replanted at Lake Omeo; in subsequent years plants grown from seed at La Trobe University were used. The results of seedling planting to October 1991 are presented in Table 2. On 26 March 1992, 17 Austral Toad-flax plants survived the summer drought period, of which only one was an individual planted in April 1991. These 16 plants represent a seedling survival rate of 55%.

In April 1991 sufficient seed was available from cultivated plants at La Trobe University Botany Department for seed broadcast. Five hundred seeds were sown in April into an area burnt by CNR earlier in that month. Seeds were sown at a rate of 1 per 10 cm<sup>2</sup>. Fifty seedlings were detected in the broadcast plot in October 1991, and 28 of these seedlings survived the summer (counted 26 March 1992). The survival rate of 56% compares favourably with that of 10% reported for seedling survival over summer for the natural Kambah population near Canberra (Briggs & Leigh 1989). A further 1000 seeds were broadcast at Lake Omeo in early winter, 1992.

Deaths of Austral Toad-flax plants in the re-establishment work were due to slugs and possibly Common Garden Snails (*Helix aspersa*), particularly in winter and early spring. (Fuel-reduction burns markedly reduce populations of both slugs and snails). However, plants that are not consumed by these molluscs, flower and set fruit in the summer, whether the season of planting is autumn or spring. Summer drought also killed planted Austral Toad-flax.

## Intended Management Action

The Gippsland Area, in conjunction with Flora and Fauna Branch, will:

- Confirm localities, population size, habitats and associated vegetation communities, grazing and fire regimes for all the five known population sites.

- Conduct an experimental burn at the Rocky Plain site and quantify germination response to fire. If this is successful, progressively implement an appropriate fire regime at other sites.
- Monitor the five known sites to establish population sizes.
- Continue detailed monitoring of the Lake Omeo population.
- Establish detailed monitoring at Green Hills to estimate the mobility of plants within a population, and verify the lifespan of individual plants.
- Train relevant CNR field staff in identification and monitoring techniques, which may assist in the location of further populations.
- Establish, through consultation and negotiation with the landholder of Green Hills, the most appropriate mechanisms for continued survival of the species at that site.
- Maintain and document the historical grazing and burning regime and provide financial support for control of Blackberry invasion in Austral Toad-flax habitat at the Green Hills site.
- Continue *ex situ* conservation at La Trobe University, and establish a population of 200 or more plants for seed in the Royal Botanic Gardens annexe at Cranbourne within two years.
- Establish experimental plots of Austral Toad-flax at the Oriental Claims Historic Area and Black Camp Creek. If these are successful, aim to establish further populations through replanting and direct seeding after burning at these secure sites.
- Investigate and identify additional potential establishment sites within the previous known range of the Austral Toad-flax to provide long-term conservation security for this species on public land (e.g. Alpine National Park, Buchan Caves Reserve and Blond Bay Wildlife Reserve (on the northern shore of Lake Victoria)).
- Disseminate information to CNR field workers, community groups and members of the public through this action statement and the Land for Wildlife scheme.
- Liaise with the Victorian Conservation Trust regarding the priority Green Hills may have in their portfolio of potential property purchases. Later resale of the land under a strict covenant (which would allow the possibility of an agistment or lease) would also be feasible.

## Other Desirable Management Actions

- Involve the Bairnsdale and District Field Naturalists' Club and the Society for Growing Australian Plants and Land for Wildlife property owners in surveys and monitoring.
- Establish a Friends Group through the National Threatened Species Network that includes the Austral Toad-flax as part of its concern.

## Legislative Powers Operating

### Legislation

*Flora and Fauna Guarantee Act 1988*: provides for the protected flora controls and the determination of critical habitat if so designated.

*Conservation, Forests and Lands Act 1987*: provides for Land Management Cooperative Agreements.

*Crown Land (Reserves) Act 1978*: provides for the creation and protection of reserves.

*Land Conservation Act 1970*: provides for the determination of uses and reservation of Crown land.

*Planning and Environment Act 1987*: provides for agreements on land-use controls as covenants on title between landholders and responsible authorities with input from referral authority (e.g. CNR).

*Vermin and Noxious Weeds Act 1958*: provides for control of pest plants and animals.

### Licence/Permit Conditions

Permits for the collection of Austral Toad-flax seed, roots or foliage will only be given for work that is in accordance with the prescribed management actions and achievement of the major conservation objectives.

### Consultation and Community Participation

The World Wide Fund for Nature and La Trobe University Botany Department have had a long history of involvement with this species, as have members of the community around Omeo and Gillingall Station. The landholder at Gillingall has been involved in developing this action statement.

### Implementation, Evaluation and Review

The Area Manager, Gippsland, will be primarily responsible for coordinating and implementing this Action Statement. Actions will be evaluated annually, and the Action Statement reviewed in 5 years.

### Contacts

#### Management

Flora and Fauna Guarantee Officer, Bairnsdale

#### Biology

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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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