

# Action Statement

Flora and Fauna Guarantee Act 1988

No. 98 (Revised in 2008)

## Wrinkled Buttons

### *Leiocarpa gatesii*

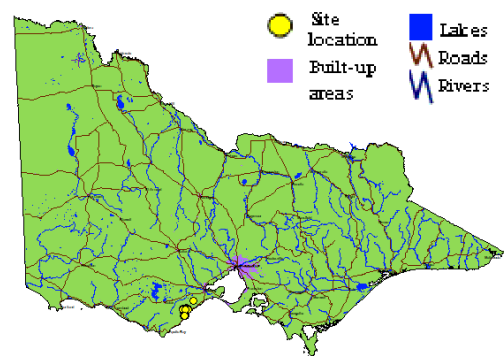
This revised Action Statement is based on the draft national Recovery Plan prepared for this species by DSE under contract to the Australian Government Department of the Environment, Water, Heritage and the Arts.

#### Description

Wrinkled Buttons (*Leiocarpa gatesii*; formerly *Leptorhynchos gatesii*) is a slender perennial (occasionally annual) herb, to 30 cm tall, with narrow leaves along white, cottony stems (Mueck 1997; Walsh & Entwisle 1999; DNRE 2001). The leaves are alternate, narrow and blunt, to about 20 mm x 5 mm. They are dark green and more or less hairless above, but white and densely hairy below (Leigh *et al.* 1984; DNRE 2001). The plant bears yellow button-like flower heads, to 20 mm across, consisting of numerous, small, tubular florets, and surrounded by overlapping rows of narrow, brown, bracts, covered with white hairs (DNRE 2001). Flower heads are borne singly at the ends of the stems, and appear from December to April (rarely to July) (Leigh *et al.* 1984; Walsh & Entwisle 1999). The fruit is a hairless, non-beaked achene (Leigh *et al.* 1984). This taxon can be distinguished from other species of *Leiocarpa* by its bell-shaped flower heads with wrinkled bracts which increase in size from the outside to the inside (Wilson 2001).

#### Distribution

Wrinkled Buttons was first discovered in 1921 by A.C.F. Gates near Lorne (Leigh *et al.* 1984; DNRE 1999). However, it was presumed extinct for many years after, until rediscovery by M. White nearly a year after the 1983 Ash Wednesday bushfires (White 1984). Since then, *Leiocarpa gatesii* has been found at 10+ sites within the Lorne/Anglesea area on dry hillside areas in open forest (DNRE 1999). Recently recorded *Leiocarpa gatesii* populations occur near Lorne in the Angahook - Lorne State Park or nearby state forest (Mueck 1997; DNRE 2001). Four populations were known to exist in 1999 (DNRE 1999). A number of populations exist on private property in and around Lorne.



**Distribution in Victoria**  
(Flora Information System DSE 2007)

#### Abundance

It is estimated that 5000 - 25000 individuals exist, although the rhizomatous nature of plants in some populations may suggest that this figure is an overestimate. These plants occur in 10 - 15 populations. The extent of range and abundance of *Leiocarpa gatesii* prior to European settlement is unknown. It is likely that *Leiocarpa gatesii* has always been restricted to the Lorne / Anglesea area, and that species abundance has fluctuated greatly depending on fire frequency and landscape heterogeneity.

## Habitat

Populations of Wrinkled Buttons tend to occur in dry open forest, usually on hillsides. Mueck (1997) reported populations within either Damp Forest or Lowland Forest (*sensu* DNRE 1997). Individuals surveyed by T. Faggetter, M. White and S. Platt in 1984, occurred in Scentbark (*Eucalyptus aromaphloia*) - Red Ironbark (*Eucalyptus tricarpa*) open forest with an understorey of Varnish Wattle (*Acacia verniciflua*), Thatch Saw-sedge (*Gahnia radula*) and Large-leaf Bush-pea (*Pultenaea daphnoides*).

## Important populations

Important populations necessary to the long term survival and recovery of Wrinkled Buttons occur in the following locations:

<i>Land tenure/reservation</i>	<i>Population and size estimate</i>
Angahook - Lorne State Park (managed by Parks Victoria)	Moggs Creek Track (Sheet 9 <i>sensu</i> Mueck 1997) (>10 000 plants).
	Coal-Mine Creek Track (Sheet 8 <i>sensu</i> Mueck 1997) (O. Carter pers. obs. 8/11/02) (>100 plants).
	Gentle Annie Track A (Sheet 3 <i>sensu</i> Mueck 1997) (>15 plants).
	Gentle Annie Track B (Sheet 4 <i>sensu</i> Mueck 1997) (>500 plants).
	Wonwondah Falls Track ('Hendersons' Track). 200m from Sharps Track (first seen 1996 and confirmed by O. Carter pers. obs 8/11/02) (>300 plants).
	Five-Mile Track along entire length (Perkins pers. obs 2002) (>10 000 plants).
	Cumberland Link Walking Track (Perkins pers. obs 2002) (<100 plants)
	Powerline easement adjacent to the Deans Marsh Lorne Road A (Sheet 5 <i>sensu</i> Mueck 1997) (>1000 plants).
	Powerline easement adjacent to the Deans Marsh Lorne Road B (Sheet 6 <i>sensu</i> Mueck 1997) (~500 plants).
	Powerline easement adjacent to the Deans Marsh Lorne Road C (Sheet 7 <i>sensu</i> Mueck 1997) (~5 plants).
State Forest (managed by DSE)	Seaview Rd-Otway State Forest A (Sheet 1 <i>sensu</i> Mueck 1997) (~50 plants)
	Seaview Rd-Otway State Forest B (Sheet 2 <i>sensu</i> Mueck 1997) (100-200 plants)

## Life history and ecology

Longevity of seeds and plants is not documented. Observations suggest, however, that Wrinkled Buttons may produce long-lived persistent soil seed banks; plants may live for as long as 13 years (DNRE 1999). Recruitment of *Leiocarpa gatesii* has been observed after fire and soil disturbance, suggesting that this species is a fire ephemeral (DNRE 1999).

## Conservation status

### National conservation status

Wrinkled Buttons is listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

This taxon may be a post-disturbance ephemeral (although perhaps persisting for several years). Its initial discovery in 1921 followed fires that occurred in the area in 1919. Many new populations were discovered after the 1983 Ash Wednesday fires (SAC 1996). Recruitment has also been observed following other physical disturbances such as track works: a possible explanation for the plants' frequent occurrence on roadsides (M. McDonald & L. Murnane pers. comm.). Inappropriate fire or other disturbance regimes, however, could cause declines in populations and apparent local extinction.

### Victorian conservation status

Wrinkled Buttons is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

It is considered vulnerable in Victoria according to DSE's *Advisory List of Rare or Threatened Plants in Victoria - 2005* (DSE 2005).

## Decline and threats

### Current threats/perceived risk

#### Lack of biomass reduction or physical disturbance

High: Lack of fire since 1983 has led to possible declines in abundance at some sites. Populations discovered in recent years have tended to occur where soil has been disturbed, such as during

track maintenance. Fire frequency, intensity and season may have important effects on long-term survival of this taxon (SAC 1996).

#### Weed invasion

Moderate: *Leiocarpa gatesii* often occurs beside roads and tracks in fairly open vegetation, which are susceptible to high levels of weed invasion (e.g. by Sweet Vernal Grass (*Anthoxanthum odoratum*)). Dumping of garden waste is the likely cause of high weed invasion along the Powerline Easement sites, adjacent to the Deans Marsh-Lorne Road.

#### Inappropriate track widening or maintenance

Moderate: Although some track works appear to have triggered germination of *Leiocarpa gatesii*, continued physical disturbance may damage established individuals or spread weeds. For example, road maintenance works destroyed part of the Seaview Road population in 1997 (Mueck 1997). Conversely, track maintenance and widening may also help this taxon by removing competition.

#### **Potential threats/perceived risk**

##### 4WD or trailbike riding

Low: Trailbikes and 4WDs are active in the area and may disturb populations.

##### Inappropriate biomass reduction / fire regimes

High: Controlled burns are difficult to implement in many areas where this taxon is found, partly due to steep hillslopes and proximity to residential areas (L. Murnane pers. comm.). As a result, fires may be less frequent than is needed for long-term survival. Slashing or soil disturbance during

#### **Long term objective**

To ensure that the Wrinkled Buttons can survive, flourish and retain its potential for evolutionary development in the wild.

#### **Specific Objectives, Actions and Targets**

*The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.*

#### **Objective I Increase knowledge of biology, ecology and management requirements**

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
1. Acquire baseline population data including: identification of the area and extent of the population; estimates of the number, size and structure of the population; and inference or estimation of population change.	<ul style="list-style-type: none"> <li>▪ Review all known sites to make sure there is no duplication (e.g. due to different GPS readings).</li> <li>▪ Updated records on all state databases (Flora Information System, VROTPop, Biosites and Herbaria).</li> </ul>	DSE
2. Assess habitat characteristics and/or condition. Accurately survey known habitat, and collect floristic and environmental information relevant to	<ul style="list-style-type: none"> <li>▪ Quantify essential life history stages, and mechanisms for recruitment and dispersal identified at known sites.</li> </ul>	DSE

trackworks has previously caused accidental proliferation of some populations, but in future should only be done where there is some level of confidence in the expected recruitment or regeneration.

#### **Previous management action**

- A Flora and Fauna Guarantee Action Statement was published in 1999.
- An ongoing survey of Angahook Lorne State Park for new populations and sub populations has been conducted by Anglesea, Aireys Inlet Society for the Protection of Flora and Fauna (ANGAIR) and Parks Victoria staff.
- Private land around the Lorne area has been surveyed for new populations and sub-populations.
- Signage has been erected at sites on tracks within Angahook Lorne State Park and State Forest.
- DSE has liaised with Parks Victoria to manage known sites and reduce the threat of 4x4 vehicles for populations.
- Ongoing monitoring of known sites has been conducted by Parks Victoria, as have ongoing surveys for new populations within the park.
- A strong link with ANGAIR has been maintained to undertake on-ground survey and monitoring.
- A known site (Lorne Golf Club) has been protected through planning referrals by Surf Coast Shire, including VCAT hearings.

	community ecology and condition.	<ul style="list-style-type: none"> <li>▪ Determine critical habitat and important populations</li> </ul>	
3.	Conduct survey to locate suitable habitat. Identify and survey potential habitat using ecological, historical and anecdotal information indicating habitat preference.	<ul style="list-style-type: none"> <li>▪ Sites of potential habitat identified and surveyed, including unconfirmed records: at Big Hill Track (Mueck 1997), Clark Spur Track (Mueck 1997), Lorne Golf Course, and Bruce Waller's (PV) property.</li> </ul>	DSE
4.	Identify disturbance regimes to maintain habitat or promote regeneration and recruitment.	<ul style="list-style-type: none"> <li>▪ Preparation of management prescriptions for ecological burning of the Coalmine Creek population.</li> <li>▪ Preparation of management prescriptions for ecological slashing within areas of four selected sites.</li> </ul>	Parks Victoria
5.	Undertake research to identify key biological functions. Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity, and recruitment levels. Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration	<ul style="list-style-type: none"> <li>▪ Seed bank/regenerative potential quantified for targeted populations.</li> <li>▪ Longevity of seed in soil determined.</li> <li>▪ Pollinator(s) identified</li> <li>▪ Stimuli for recruitment/regeneration identified.</li> <li>▪ Management strategies identified to maintain, enhance or restore regenerative processes fundamental to reproduction and survival.</li> </ul>	DSE Royal Botanic Gardens
6.	Undertake periodic surveillance monitoring of populations. Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages, and morphological data.	<ul style="list-style-type: none"> <li>▪ Techniques for monitoring developed and implemented.</li> </ul>	DSE Parks Victoria
7.	Analyse population trends. Collate, analyse and report on census data and compare with management histories.	<ul style="list-style-type: none"> <li>▪ Growth rates determined and Population Viability Analysis completed for targeted populations.</li> </ul>	DSE

**Objective II To increase the number of populations or individuals**

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
8. Store reproductive material. Establish a seed bank.	<ul style="list-style-type: none"> <li>▪ Long-term storage facility identified.</li> <li>▪ Seed from target populations in long term storage.</li> </ul>	DSE, Royal Botanic Gardens
9. Determine seed viability.	<ul style="list-style-type: none"> <li>▪ Seed viability determined.</li> </ul>	DSE, Royal Botanic Gardens

**Objective III To improve the condition of habitat**

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
10. Manage environmental weeds. Control threats from pest plants by herbicide application and hand removal of weeds.	<ul style="list-style-type: none"> <li>Measurable seedling recruitment/vegetative regeneration.</li> </ul>	Parks Victoria

**Objective IV To secure populations or habitat from potentially incompatible land use or catastrophic loss.**

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
11. Develop management prescriptions and/or zoning for state forest.	<ul style="list-style-type: none"> <li>Establish a Special Protection Zone for <i>Leiocarpa gatesii</i> at Seaview Rd–Otway State Forest A and B within state forest.</li> </ul>	DSE
12. Negotiate cooperative management agreements with private landholders.	<ul style="list-style-type: none"> <li>Negotiate voluntary conservation agreements with private landholders at the powerline easement adjacent to the Deans Marsh Lorne Road A, B, and C sites.</li> </ul>	DSE
13. Establish cultivated plants <i>ex situ</i> to safeguard from the unforeseen destruction of the wild population.	<ul style="list-style-type: none"> <li>Effective propagation and cultivation techniques developed.</li> <li>At least 50 mature plants in cultivation from a variety of populations to represent the geographic (and genetic) range of the species.</li> </ul>	DSE Royal Botanic Gardens
14. Erect/maintain structures to restrict or control access. Control accidental damage by preventing access/re-routing tracks, fencing and signage.	<ul style="list-style-type: none"> <li>Measurable reduction in plant mortality at Moggs Creek Track, Coal-Mine Creek Track, Gentle Annie Track A &amp; B, and Wonwondah Falls Track..</li> </ul>	Parks Victoria
15. Liaise with private landholders. Ensure that information and advice about the recovery of <i>Leiocarpa gatesii</i> has been provided to private land managers and landholders.	<ul style="list-style-type: none"> <li>All private land managers are aware of the species and its management needs.</li> </ul>	DSE
16. Liaise with government agencies. Ensure that information and advice about the recovery of <i>Leiocarpa gatesii</i> has been provided to public land managers, local government authorities and Catchment Management Authorities.	<ul style="list-style-type: none"> <li>All relevant authorities and land managers are aware of the species and its management needs.</li> </ul>	DSE

**Objective V To increase community awareness and support**

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
17. Involve community groups and volunteers in recovery activities.	<ul style="list-style-type: none"> <li>Opportunities for involvement identified, promoted and supported.</li> </ul>	DSE

## References

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This Action Statement has been prepared under section 19 of the Flora and Fauna Guarantee Act 1988 under delegation from Mr Peter Harris, Secretary, Department of Sustainability and Environment, July 2008.

Published by the Victorian Government Department of Sustainability and Environment

Melbourne, July 2008

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ISSN 1448-9902

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