

# Action Statement

Flora and Fauna Guarantee Act 1988

No. 001 (Revised in 2008)

## Buxton Gum *Eucalyptus crenulata*

*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

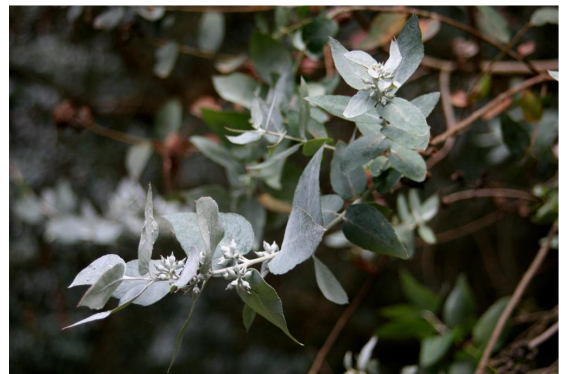
Buxton Gum (*Eucalyptus crenulata* Blakely & de Beuzeville; also known as Silver Gum or Buxton Silver Gum) is a distinctive small tree of irregular form to 12 m high. The species is the only member of *Eucalyptus* series *Crenulatae*.

The bark of the mature tree is persistent and rough over most of the lower trunk, but gives way to smooth bark on the upper trunk and branches. The leaves are ovate, to 6 cm long, sessile, stem-clasping and crenulate (have small indentations along the margins). They are initially glaucous (blue green in colour with a hoary surface of white wax particles), but age to glossy dark green on the upper surface.

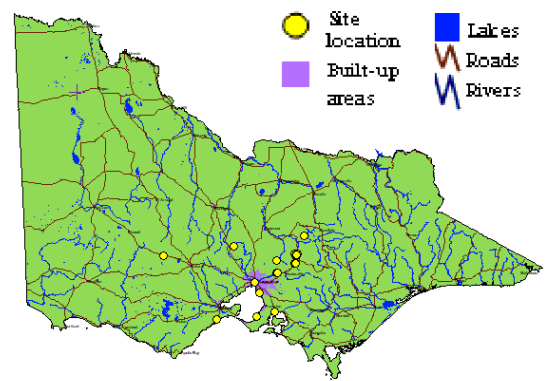
Buxton Gum is one of the few *Eucalyptus* species which retains distinctive juvenile-type foliage throughout its life (Potts and Wiltshire 1997). The highly glaucous buds are ovoid with a beaked apex, and are borne in clusters of up to eleven in the axils of the upper leaves. During spring, Buxton Gum has clusters of cream, honey-scented flowers. The fruits, to 4 mm long and 4 mm wide, are cup shaped and sessile or shortly pedicellate (stalked). For more detailed descriptions of this species, see Blakely & de Beuzeville (1939) and Brooker & Slee (1996).

### Distribution

Buxton Gum is endemic to Victoria and known from only two natural populations. It is unlikely that additional populations will be found. The populations are approximately 64 km apart, and are separated by the Great Dividing Range. One population occurs on the periodically swampy alluvial flats of the Acheron River valley near Buxton, and the other on the floodplain of the Yarra River at Yering. At the latter location, at least



Buxton Gum (Photo: DSE/Backhouse)



Distribution in Victoria  
(Flora Information System DSE 2007)

some of the mature Buxton Gums are thought to be hybrids between *Eucalyptus crenulata* and Swamp Gum (*Eucalyptus ovata*) (Adams & Simmons 2000), and the characteristics of individual trees may not be entirely consistent with the species description in the botanical literature (Blakely & de Beuzeville 1939). Throughout this document the name *E. crenulata* or Buxton Gum will be used to refer to both 'pure' breeding *Eucalyptus crenulata* and hybrids.

### Abundance

*Eucalyptus crenulata* is rare both in terms of abundance and distribution. There are only two wild populations, which together occupy an area of less than 10 ha. Fewer than 700 individuals remain in the wild, and the species is likely to have been naturally rare prior to European settlement.

### Important populations

The Buxton population is comprised of three small sub-populations, which were presumably part of a more or less continuous distribution of the species in the area. These sub-populations are now isolated from one another by cleared pasture.

The largest of these isolates comprises approximately 600 individuals (Adams & Simmons 2000) and covers about 4 ha of the 16.9 ha Buxton Silver Gum Reserve (which is managed by Parks Victoria). The other smaller sub-populations are on freehold land. One sub-population consists of nine scattered trees on grazed land immediately adjacent to the reserve (sub-population B), and the other contains fewer than 50 individuals within a small remnant of vegetation approximately 0.5 km distant (sub-population C).

The second population consists of approximately eight mature trees scattered over 4 ha on Spadoni's Nature Conservation Reserve at Yering near the confluence of Olinda Creek and the Yarra River; this site is managed by Parks Victoria. The remaining individuals of the original population of Buxton Gum at this location are on freehold land. Numerous individuals have been established through planting of tube-stock on the adjacent Spadoni's Recreation Reserve which is managed by the Shire of Yarra Ranges.

Buxton Gum is an attractive tree and is commonly grown as an ornamental across south-eastern Australia. There are now far more individuals of this species in cultivation than in the wild. Buxton Gum is naturalised at a number of locations outside its natural range, notably at Flowerdale (Victoria), but also as far afield as the Southern Tablelands of NSW (Carr 1993; Geoff Carr, Ecology Australia Pty. Ltd. pers. comm.).

### Habitat

The Yering population is situated on the floodplain of the Yarra River. The soils are deep alluvial loams, and the general topography is flat with scattered, periodically inundated depressions. Dominant associated overstorey species include Swamp Paperbark (*Melaleuca ericifolia*), Swamp Gum (*Eucalyptus ovata*) and Manna Gum (*E. viminalis*). Common Tussock-grass (*Poa labillardieri*), and introduced pasture grasses and herbs (Adair 1978), dominate the understorey. Other notable plant species at the site include Poison Rice-flower (*Pimelea pauciflora*) which is rare in Victoria (Rosengren *et al.* 1983, Ross 2000). The site has been partially cleared for pasture, and significant alterations have been made to the drainage patterns across the floodplain.

At Buxton, *E. crenulata* occupies a poorly drained hollow on the alluvial terraces adjacent to the Acheron River. The site is an open forest dominated by Swamp Gum (*Eucalyptus ovata*) with Mountain Swamp Gum (*Eucalyptus camphora*) on the wettest sites and Narrow-leaf Peppermint (*E. radiata*) on the drier raised areas. *Eucalyptus crenulata* occurs as an understorey tree beneath *E. ovata*, but is the dominant overstorey species in a particularly waterlogged area. The relief is low and the soils are predominantly stiff clays derived from the weathering of Devonian marine sediments. The site is botanically rich and unusual. Of particular interest is the preponderance of Button Grass (*Gymnoschoenus sphaerocephalus*) and Sphagnum Moss (*Sphagnum* sp.) in the understorey of the poorly drained parts of the reserve (Carr 1978 and M. White unpublished data). An outlying stand (sub-population C) in the Buxton area occurs as an understorey tree in a remnant stand of *Eucalyptus ovata* which occupies a broad swampy drainage line.

### Life history and ecology

Apart from a limited number of preliminary studies (notably Simmons & Parsons 1976 and Adams & Simmons 2000), little is known of the biology and ecology of *Eucalyptus crenulata*. Information has largely been gleaned from field observations, site inventories, qualitative monitoring and the horticultural performance of the species.

### Conservation status

#### National conservation status

Buxton Gum is listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

#### Victorian conservation status

Buxton Gum is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

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

### **Decline and threats**

*Eucalyptus crenulata* has declined in range and abundance over the past 150 years due to land clearing for agriculture. Evidence for its decline through clearing at both Yering and Buxton is largely anecdotal. However, Pryor (1981) noted that the species had disappeared from several sites where it was previously recorded, and Willis (1972) noted the destruction of individual trees at the Buxton site. There is no evidence that the species existed in the wild at locations other than Yering and Buxton. Although deliberate clearing of wild *E. crenulata* has not been documented or observed in the last 25 years, the construction of a walking track at Buxton in the 1970s probably resulted in the loss of some individuals. Recent studies of aerial photography from 1952 to the present indicate that the area occupied by *E. crenulata* at Buxton has not decreased significantly over the last 50 years (Adams & Simmons 2000).

Buxton Gum is vulnerable to threats that may result in the loss of wild populations in the future. Both remaining populations are extremely localised, and are susceptible to weed invasion and other catastrophic events such as disease and wildfire. In addition, altered disturbance regimes may have impaired the ability of the species to effectively recruit new adult plants. Of acute concern at Buxton is the presence of the pathogenic soil-borne Cinnamon fungus (*Phytophthora cinnamomi*) (Adams & Simmons 2000) and an infestation by the twining hemi-parasitic plant, Coarse Dodder-laurel (*Cassytha melantha*). At Yering, the site has been grossly modified by past land use, river regulation and floodplain works. It is unlikely that the array of environmental parameters that maintained a self-sustaining population of *E. crenulata* at this site are still extant.

### **Current threats/perceived risk**

#### Hybridisation and genetic issues

High - There are a number of potential genetic consequences of population decline, isolation and fragmentation.

#### Environmental factors leading to a lack of recruitment

High - The Yering site is subject to gradual environmental degradation.

### **Long term objective**

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

#### Poor health

Moderate - Although many plants have exhibited poor health, no mortalities have resulted as yet.

#### Weed invasion

High - Serious environmental weeds are present at both sites.

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

#### Grazing

High - On private land sites if grazing continues.

#### Lack of recruitment

Moderate - If mature trees senesce and recruitment of juveniles still does not occur.

#### Hybridisation and genetic issues

High - Particularly if the frequency of hybridisation increases at the Buxton Silver Gum Nature Conservation Reserve.

### **Previous management action**

#### **Buxton**

- 2000 - Health, recruitment and survival baseline monitoring set up and data collected (Threatened Species Network Grant).
- 2000 - Small trial set up to measure response of individual Buxton Gums to physical removal of Dodder Laurel.
- 2000 - 2003 - Revegetation of open area adjacent to the Buxton gum population. Approximately 1.5 ha planted with Buxton Gum and other local indigenous over-storey species. Planting completed by Parks Victoria and various community groups.
- 2001 - Information board updated at the reserve.
- 2003 - Public access walk upgraded to Acheron River and steps taken to discourage use of the walkway within the Buxton Gum population.

#### **Spadoni's Reserve**

- Weeds are controlled annually.
- Fence has been repaired.
- Monitoring is ongoing

### 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 To increase knowledge of biology, ecology and management requirements

Action	Targets	Responsible
1. Identify core habitat. Accurately survey known habitat, and collect floristic and environmental information relevant to community ecology and condition.	<ul style="list-style-type: none"> <li>▪ Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites.</li> <li>▪ Core habitat mapped.</li> </ul>	DSE
2. Undertake research to identify key biological functions. Evaluate current reproductive and regenerative status by determining 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>▪ Regenerative potential quantified for each population.</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
3. Undertake periodic surveillance monitoring of populations. Continue to census the population at Buxton at five yearly intervals, using the methodology established by Adams & Simmons (2000). Incidental monitoring of the site using VROTPop to be carried out at least once a year.	<ul style="list-style-type: none"> <li>▪ Census data for target populations collected.</li> </ul>	DSE, Parks Victoria
4. Collate, analyse and report on data and compare with management histories.	<ul style="list-style-type: none"> <li>▪ Results reported and discussed following Adams &amp; Simmons (2000) methodology.</li> <li>▪ Management recommendations presented to DSE North East Region and Parks Victoria.</li> </ul>	DSE

#### Objective II To secure populations or habitat from potentially incompatible land use or catastrophic loss

Action	Targets	Responsible
5. Negotiate voluntary management agreements with private landholders.	<ul style="list-style-type: none"> <li>▪ Agreements established for naturally occurring populations on private land at Yering and Buxton.</li> </ul>	DSE
6. Provide information and advice to local government authorities for inclusion in planning processes. Ensure that planning permits are not issued to clear naturally-occurring populations of Buxton Gum.	<ul style="list-style-type: none"> <li>▪ Advice documented and provided.</li> <li>▪ No clearing of natural populations permitted.</li> </ul>	DSE, Shire of Yarra Ranges, Murrindindi Shire
7. Store reproductive material as a safeguard against catastrophic loss. Collect and submit to long-term storage genetically representative seed from both sites.	<ul style="list-style-type: none"> <li>▪ Seed from Buxton and Yering sites collected, treated and stored according to accepted protocols for long-term storage of seed.</li> </ul>	DSE, Parks Victoria, Royal Botanic Gardens
8. Liaise with private landholders. Ensure that information and advice about the recovery of Buxton Gum has been provided to private land	<ul style="list-style-type: none"> <li>▪ All private land managers are aware of the species and its management needs.</li> </ul>	DSE

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managers and landholders.

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| 9. Liaise with government agencies. Ensure that information and advice about the recovery of Buxton Gum 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 |
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**Objective III To improve condition of habitats**

Action	Targets	Responsible
10. Manage weeds. Control threats from pest plants by using integrated weed control.	<ul style="list-style-type: none"><li>▪ Measurable seedling recruitment/vegetative regeneration at the Buxton and Yering sites;</li><li>▪ Measurable reduction in plant mortality at the Buxton and Yering sites.</li></ul>	Parks Victoria
11. Control/reduce human disturbance. Control threats from visitation by allowing vegetation to grow over the board-walk at Buxton and Yering sites.	<ul style="list-style-type: none"><li>▪ Access effectively restricted.</li></ul>	Parks Victoria

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

Action	Targets	Responsible
12. 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

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