

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this Conservation Advice on 01/04/2016.

Conservation Advice

Daviesia laevis

Grampian's bitter-pea

Conservation Status

Daviesia laevis (Grampian's bitter-pea) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as prior to the commencement of the EPBC Act, it was listed as Vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factor that is the cause of the species being eligible for listing in the Vulnerable category is its low number of mature individuals (less than 1000 plants).

The Grampian's bitter-pea is also listed as Threatened in Victoria under the *Flora and Fauna Guarantee Act 1988* and has been assessed as Vulnerable in the *Advisory List of Rare or Threatened Plants in Victoria* (DEPI, 2014).

Description

The Grampian's bitter-pea is a perennial shrub which grows to 2-4 m tall. It has smooth, arching, 'frosted-looking' branches. Its phyllodes (modified leaves) are narrow, grey-green, slightly flexible and leathery, with a prominent midrib. Its flowers grow in sets of five to 15 evenly spaced, tiny pea-flowers along a stem, with about three such stems per branch. Flowers have orange-yellow petal clusters around a brownish-red-marked centre. Flowering occurs from October to November. Fruits appear in January and are straw to light brown in colouring, tightly packed together and triangular in shape. The seeds are compressed, round and red-brown in colour with black mottling.

Distribution

The Grampian's bitter-pea is a Victorian endemic that has been recorded between Black Range State Park (SP) and Mt Cole State Forest (SF), 250 km west of Melbourne, in the Victorian Midlands IBRA bioregion.

The Grampian's bitter-pea is confirmed from seven populations and has a total abundance of approximately 200 mature plants. The following populations are known:

- Grampians National Park (NP) (SWIFFT, 2011)
 - Bovine Creek, 61 mature plants in 2010
 - Harrops Track, 11 mature plants in 2006
 - Hut Creek, a number of sites in 2010
 - Silverband Falls Road, 50-100 plants in 2011
 - Saw Mill Track, 1 adult in 2006
- Langi Ghiran SP, 30 adult plants and 8 seedlings in 2004 (Murphy et al., 2006), and an additional 33 seedlings in 2011 (SWIFFT, 2011)
- Mount Cole SF, 1 plant in 2011 (SWIFFT, 2011)

Historic records are known from Grampians NP (seven additional sites), Mt Buangor SP and Black Range SP (Murphy et al., 2006).

Relevant Biology/Ecology

The Grampian's bitter-pea occurs in protected montane sites, usually in gullies, sometimes among boulders, on sandy or skeletal soils derived from sandstone or granite (Crisp, 1991).

The species occurs in open forest dominated by *Eucalyptus obliqua* (messmate) and *E. alaticaulis* where it is most frequently seen at the margins of tall shrub thickets fringing creeks (Crisp 1991; Murphy et al. 1991). At Langi Ghiran SP, however, the species occurs on southern facing granite outcrops, sparsely distributed and often amongst boulders. Overstorey species at such sites include messmate, *Eucalyptus gonicalyx* (bundy) and (rarely) *Eucalyptus pauciflora* (snow gum), with a shrub layer that includes *Acacia melanoxylon* (blackwood), *A. oxycedrus* (spike wattle) and *A. paradoxa* (prickly acacia).

The Grampian's bitter-pea germinates following fire (Rudolph, 2011) although germination at some sites may be the result of other disturbance events (Murphy et al., 2006). Seed may remain viable in the soil seed bank for at least 30 years (Rudolph, 2011). Plants can flower as soon as 3 years following germination and plants can live for 25-30 years (Rudolph, 2011).

Threats

Table 1 – Threats impacting the Grampian's bitter-pea in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type	Threat status	Evidence base
Fire			
Fire frequency	known	current	Too frequent fire that doesn't allow plants to sexually mature (and replenish the seed bank) may cause local extinction, as has been suggested at Mount Cole SF (Crisp, 1991; Murphy et al., 2006). Seed set requires at least four years following fire (assuming that germination occurs) (SWIFFT, 2011). Too infrequent fire may not trigger germination events and cause local extinction.
Recruitment			
Low number of mature individuals	known	current	Low number of individuals can result in natural events causing population decline and local extinction. Findings suggest that predation by granivores (possibly the crimson rosella (<i>Platycercus elegans</i>) (Pritchard, pers. comm., cited in Murphy et al., 2006)) can reduce seed development (shoot length) and subsequent soil seed bank material by 35% each year (Rudolph, 2011). The swamp wallaby (<i>Wallabia bicolor</i>) has been observed browsing seedlings, which may limit successful recruitment (Kelly, pers. obs., cited in Murphy et al., 2006).
Disease			
<i>Phytophthora cinnamomi</i> infection	potential	future	Grampians bitter-pea is susceptible to dieback caused by <i>Phytophthora cinnamomi</i> infection (SWIFFT, 2011). There is no evidence of infection occurring.
Invasive species			
Weeds	potential	current	Competition from weeds is noted as a threat for some populations (Murphy et al., 2006).
Habitat loss disturbance and modifications			
Trampling	potential	current	Trampling by humans and vehicle damage are noted as threats for some populations (Murphy et al., 2006).
Timber harvesting	potential	current	Timber harvesting could impact the species in Mt Cole SF (DSE, 2008).

Conservation Actions

Conservation and Management priorities

Fire

- The Grampian's bitter-pea is a post-fire seeder (i.e. fire or disturbance stimulates germination), that is potentially impacted by inappropriate fire frequencies and intensities. The fire management regime therefore should aim to prevent wildfire from impacting the habitat, and prescribed fire should be designed with an appropriate frequency.
- Fire management should be accompanied by a carefully planned weed management strategy to control weeds encouraged by burning, and post-fire monitoring should occur.
- Provide maps of known occurrences to local and state fire management authorities and seek inclusion of mitigation measures in bush fire risk management plan/s, risk register and/or operation maps.

Breeding, propagation and other ex situ recovery action

- Establish cultivated plants ex situ for inclusion in living collections to safeguard against any unforeseen destruction of wild populations (Murphy et al., 2006).
- Establish a seed bank and determine seed viability (Murphy et al., 2006).
- Select and evaluate suitable translocation sites that are ecologically and biologically suitable, have secure land tenure and are managed appropriately. Prepare sites to achieve maximum survival of translocated plants (Murphy et al., 2006). Relevant policies should be referred to for guidance for undertaking translocations (e.g. Vallee et al., 2004).
- Install and maintain existing wire cages to prevent swamp wallaby grazing seedlings.

Disease

- Implement suitable hygiene protocols to protect known populations from outbreaks of *Phytophthora cinnamomi*.

Weeds

- Determine whether weeds are having a deleterious impact on the species. If deemed necessary, undertake weed control, using appropriate methods. This action is likely to be of particular importance following any prescribed fire, to allow for seedling recruitment.

Habitat loss disturbance and modifications

- Ensure land managers of state forests, state parks and national parks where the species occurs are aware of the species' occurrence and provide protection measures against key and potential threats.
- Protect populations on public land – continue to negotiate Special Protection Zones in Mt Cole SF (Murphy et al., 2006).
- If seed germination requirements are determined (see Information and research priorities), implement a management strategy to maintain, enhance or restore processes fundamental to reproduction and survival (Carter and Walsh, 2006).

- Control access routes by redirecting tracks, installing signs or installing fences to suitably constrain vehicle and public access to known sites on public land.

Stakeholder Engagement

- Identify opportunities for community involvement in the conservation of Grampian's bitter-pea by presentations to community nature conservation groups (Murphy et al., 2006).

Survey and Monitoring priorities

- Identify any changes to existing habitat, and identify and survey areas of potential habitat, using ecological and bioclimatic information indicating habitat preference (Murphy et al., 2006). Survey locations where historic collections occurred (SWIFFT, 2011).

Information and research priorities

- Evaluate reproductive/regenerative status and seed bank status of subpopulations by determining longevity, fecundity and recruitment levels (Murphy et al., 2006).
- Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration (Murphy et al., 2006).
- Collate, analyse and report on census data and compare with management histories (Murphy et al., 2006).

References cited in the advice

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- Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, B., and Rossetto, M. (2004). Guidelines for the translocation of threatened plants in Australia - Second Edition. Canberra, ACT: Australian Network for Plant Conservation.