

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Minister's delegate approved this Conservation Advice on 16/12/2016.

Conservation Advice

Prasophyllum morganii

Cobungra leek-orchid

Conservation Status

Prasophyllum morganii (Cobungra leek-orchid) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) effective from the 16 July 2000. The species was eligible for listing under the EPBC Act as on 16 July 2000 it was listed as Vulnerable under Schedule 1 of the preceding Act, the *Endangered Species Protection Act 1992* (Cwlth).

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

The main factors that are the cause of the species being eligible for listing in the Vulnerable category are the species' restricted geographic range and small population size.

Description

The Cobungra leek-orchid (Orchidaceae) is one of a group of orchids commonly known as leek-orchids because the erect hollow leaf has some resemblance to a leek. It is an herbaceous terrestrial orchid that dies back annually to spherical or ovoid underground tubers. The Cobungra leek-orchid produces a single, hollow and tapering leaf which grows to 25 cm long (Backhouse & Jeanes 1995). The erect flower stem emerges through a slit in the leaf and grows to 25 cm high with up to 80 small, fragrant, upward facing (non-resupinate) flowers arranged in a dense, crowded spike. Flowers are greenish with purplish stripes and toning, and the labellum (central petal) is white, pink or purple with a green callus (Backhouse & Jeanes 1995). The upper sepal is about 5 mm in length, downward-pointing and curved forward; the lateral sepals are about 6 mm in length and are erect, free and widely divergent. The petals are widely spreading with tips curved outward or downward (Backhouse & Jeanes 1995).

Distribution

The Cobungra leek-orchid is endemic to Victoria and has only ever been recorded from the type locality near Cobungra (Coates et al., 2002). No precise records exist to indicate its historical distribution however it is likely to have been a short-range endemic in the Omeo area (Coates et al., 2002). The species is likely to have been naturally rare with an extremely small population size (Coates et al., 2002).

The only known population was recorded on private land in 1933 and consisted of fewer than 15 plants (Coates et al., 2002). No plants have been seen since that time and there is strong evidence to indicate that this species is now extinct (Backhouse & Jeanes 1995; Coates et al., 2002; DSE 2003). Searches for the species were undertaken in the ten years up to 2002 by orchid society members and field naturalists that failed to re-locate the known population or other populations in the area (Coates et al., 2002).

Relevant Biology/Ecology

The Cobungra leek-orchid was known to grow in *Eucalyptus pauciflora* subsp. *pauciflora* (snow gum) open forest at about 1000 m above sea level (Backhouse & Jeanes 1995). It was found on the sunny side of a small ridge running down to a creek, where the soil was clayey with a little

quartz and sandstone (Nicholls 1930 in Coates et al., 2002). The Cobungra leek-orchid flowered between November and January (Backhouse & Jeanes 1995).

The following information applies to the general biology and ecology of leek-orchids.

Leek-orchids have a dry season dormancy period during the hotter summer and early autumn months, commencing towards the end of spring or early summer. Leek-orchids begin to shoot in response to autumn rains. Leaves are produced first during winter and flower spikes may develop in the spring (Backhouse & Jeanes 1995).

Sexual reproduction is the principle means of reproduction in many species of leek-orchids. Pollination mainly occurs by native bees and wasps that are attracted to the flowers by strong perfumes and rewards of nectar. Many other types of insects, such as syrphiid flies, visit leek-orchids and some of these may contribute to pollination (Backhouse & Jeanes 1995). Little is known of the habitat requirements of pollinators of leek orchids.

Leek-orchids propagate mainly from seed, although several species have been observed to develop into small clumps, presumably by vegetative means (Backhouse & Jeanes 1995).

Species of leek-orchid are obligate mycotrophic plants that rely on mycorrhizal fungi for seed germination. The fungi are also likely to provide nutrients to the adult plants (McQualter et al., 2007). Little is known about the mycorrhizal fungi required by leek-orchids.

Most terrestrial orchids have evolved under conditions of hot summer fires, generally when the plants are dormant (Backhouse & Jeanes 1995). The timing of fire for orchids is important, with the best time during late summer or early autumn, after seed dispersal but prior to new shoot growth. The variation in seasonal climatic conditions, most notably rainfall and temperature also influences flowering. Flowering is often restricted following periods of sustained hot, dry weather following flower opening (Todd 2000). In some species of *Prasophyllum*, flowering is enhanced by fire in the preceding summer.

Threats

Although the Cobungra leek-orchid is likely to be extinct, the following threat factors have been identified as having a negative impact on the species.

Table 1 – Threats impacting the Cobungra leek-orchid in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Habitat loss, disturbance and modification		
Habitat loss	known past	Habitat destruction is the single greatest threat to the Victorian orchid flora (Backhouse & Jeanes 1995). The site where the species grew was cleared and converted to pasture (Duncan & Coates 2010). This would have had a negative impact on the Cobungra leek-orchid via direct destruction of plants as well as habitat modification through the introduction of exotic grasses, application of fertilizers and introduction of stock.
Cattle grazing	potential	Grazing by introduced herbivores, including cattle (<i>Bos spp.</i>), on orchids can be devastating. In addition, the impact of cattle can be exacerbated by their trampling of plants that escape grazing and their introduction of weed seed in their faeces (Duncan et al., 2005). The only known site where the species was known to occur is grazed by cattle (Coates et al., 2002).

Trampling	potential	Accidental damage to individual plants and/or seedlings may be a threat if the area is frequented by visitors.
Invasive species		
Weed invasion	potential	Weed invasion is a risk to orchids because weeds directly out-compete orchids for resources and change the vegetation type and structure of the habitat. They can also alter microhabitats, which may indirectly cause a negative impact on orchid species (Duncan et al., 2005). In 2002 the risk to the Cobungra leek-orchid from weed invasion was 'likely to high', given its only known habitat has been converted to pasture (Coates et al., 2002).
Fire		
Timing and frequency	potential	The specific role of fire for the Cobungra leek-orchid is unknown. However, based on information for other terrestrial orchids, fires that occur in autumn, winter and spring, after the species shoots but before seed is set, may pose a threat. Too frequent fire may pose a threat by altering the habitat, removing organic surface materials and negatively impacting pollinators and mycorrhizal agents. In 2002 the risk from fire was low (Coates et al., 2002).

Conservation Actions

Although the Cobungra leek-orchid is probably extinct, the following conservation and management actions, survey and monitoring priorities and information and research priorities should be used to support the recovery of the species if it is re-discovered in the wild.

Conservation and Management priorities

Habitat loss, disturbance and modification

- Ensure public and private land managers are aware of the presence and location of the Cobungra leek-orchid on their land and provide protection measures against known and potential threats to the species.
- Manage access to known locations of the Cobungra leek-orchid to prevent the accidental trampling of plants.
- If livestock grazing occurs in the area, ensure land managers use an appropriate grazing regime that does not detrimentally affect the Cobungra leek-orchid. If only a few plants are known to occur consider exclusion fencing to prevent any grazing.

Invasive species

- Collaborate with public and private land managers to control and reduce the spread of any invasive species that threaten the Cobungra leek-orchid. Consult with local experts in determining the most appropriate physical or chemical control methods for these weeds that will not have a detrimental effect on the Cobungra leek-orchid.

Fire

- If only a few plants are known to occur, avoid any use of managed fire research and other activities that impact upon the persistence of the population unless there is evidence to show the impact would be a positive and enduring effect on the species' persistence.

- Fires must be managed to ensure prevailing fire regimes do not disrupt the life cycle of the Cobungra leek-orchid, they support rather than degrade the habitat necessary to the Cobungra leek-orchid, they do not promote invasion of exotic species, and they do not increase impacts of grazing.
- Ensure that prescribed fires occur only within the habitat during the dormant phase of the Cobungra leek-orchid's life cycle (summer to late autumn).
- Physical damage to the habitat and individuals of the Cobungra leek-orchid must be avoided during and after fire operations. Ensure retention of surface soil organic material and leaf litter on soil as it is important for many terrestrial orchids that rely on these materials for regeneration from seed.
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the Cobungra leek-orchid.

Seed collection, propagation and other ex-situ recovery action

- Seed should be appropriately sourced and stored in a seed bank facility using best practice seed storage guidelines and procedures to maximise seed viability and germinability.
- To manage the risk of losing genetic diversity, undertake appropriate seed and mycorrhizal fungi collection and storage in appropriate institutions, such as the Victorian Conservation Seedbank, Royal Botanic Gardens Victoria, and curate the collection to ensure sustained viability of stored seed. Seeds from representative natural populations to be collected and stored.
- Establish plants in cultivation in appropriate institutions such as the Royal Botanic Gardens Victoria.

Stakeholder Engagement

- Identify partners including traditional owners, landholders, community-based organisations and conservation management organisations that may be associated with recovery of the Cobungra leek-orchid.
- Promote opportunities for partners to participate in recovery efforts for the Cobungra leek-orchid, as appropriate.

Survey and Monitoring priorities

- Undertake survey work, when plants are flowering between November and January, in suitable habitat and potential habitat to locate any additional occurrences.
- Undertake survey work, when plants are flowering between November and January, of past or known populations to establish baselines where required to identify changes (if any) in population size, distribution, ecological requirements and relative impacts of threatening processes.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Monitor the size, structure and reproductive status of populations of the Cobungra leek-orchid at different stages in the fire cycle. Opportunities to monitor after planned and unplanned fires should be undertaken where they occur in order to improve understanding of the fire response of this species.

- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the Cobungra leek-orchid.

Information and research priorities

- Investigate options for linking, enhancing or establishing additional populations.
- Investigate reproductive status, longevity, fecundity and recruitment levels for this species in order to form a view on the resilience of this species to known and potential threats and adjust conservation actions as required.
- Continue to undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment, including disturbance and mycorrhizal fungi requirements.
- Improve understanding of the mechanisms of response to different fire regimes and identify appropriate fire regimes for conservation of this species by undertaking appropriately designed experiments in the field and/or laboratory.
- Where appropriate, use understanding and research on fire response among related (e.g. congeneric) or functionally similar species to develop fire management strategies for conservation.
- Identify optimal fire regimes for regeneration (vegetative regrowth and/or seed germination), and response to other prevailing fire regimes.
- Undertake research into pollinator activity and the ecological requirements to support pollinator communities of the orchid.

References cited in the advice

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