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

Conservation Advice

Nematolepis frondosa

leafy nematolepis

Conservation Status

Nematolepis frondosa (leafy nematolepis) 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 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 that the area of occupancy is very restricted, there is only one population and the number of mature individuals is limited.

Description

The Leafy Nematolepis *Nematolepis frondosa* (previously known as *Phebalium frondosum*; see Wilson 1998) is a leafy conical shrub growing to 7 m tall, with branches that emerge horizontally or arch downward. Branchlets are strongly angled and rust coloured, or covered with small, silvery, membranous scales. Leaves are broadly elliptic, to 23 mm x 15 mm and lack a distinct midrib. The upper surface is hairless, glandular and often appears speckled white, while the lower surface is covered with silvery scales. Flowers are white and star-shaped, to 9 mm across, the five petals are ovate, hairless and sparsely glandular around the centre, the calyx is cup-like and hairless, to 2.5 mm long, with triangular lobes, while the stamens are slightly shorter than petals. Flowering occurs in winter and spring and winter. Seeds are oblong and black, about 3 mm long, and slightly keeled dorsally (description from Walsh & Albrecht 1988; Walsh & Entwisle 1999).

Distribution

The leafy nematolepis is endemic to eastern Victoria, where it is restricted to the upper slopes of Mt Elizabeth, between Bruthen and Ensay.

The single population of leafy nematolepis was estimated to contain 3,100 plants, in three discrete groups (sub-populations) containing 2,000 plants, 1,000 plants and 100 plants. All plants have been recorded in State Forest on Mt Elizabeth.

Relevant Biology/Ecology

There have been no specific ecological or biological studies of the leafy nematolepis. Nothing is known of its autecological characteristics, such as fire behaviour, longevity of plants soil-stored seed, and pollination biology. The single known population is largely even-aged and relatively large, but disturbance at the site tends to promote more or less continuous recruitment. The species germimates from a soil seedbank.

The leafy nematolepis occurs from 820 – 960 m altitude on Mt Elizabeth, and grows in varied habitat ranging from low rock outcrop scrub near the mountain summit, to tall open forest dominated by *Eucalyptus regnans* (mountain ash) at the lower altitudinal range. Associated

species within the rock outcrop scrub include *Kunzea ericoides* (burgan), *Pomaderris aspera* (hazel pomaderris), *Pomaderris prunifolia* (plum leaf pomaderris) and *Ozothamnus cuneifolius* (wedge-leaf everlasting). Tall open forest sites on lower slopes contain *Acacia dealbata* (silver wattle), *Olearia lirata* (snowy daisy bush), *Prostanthera walteri* (monkey mint bush) and *Zieria arborescens* (stinkwood). Topography varies from flat to moderately steep on south, southwesterly, north, northwesterly and westerly aspects. Soils vary from skeletal at the summit population, to deep mountain loams, on rhyolitic or granodiorite parent material (Walsh & Albrecht 1988). Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

The leafy nematolepis is threatened by too frequent fire and potentially by logging. These threats and their effects on the leafy nematolepis are described in the table below. The threats outlined below have corresponding conservation management priorities.

Table 1 – Threats impacting the leafy nematolepis in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Fire		
Too frequent burning	suspected current	Fires occurring at intervals less than five years are likely to destroy plants before they are old enough to produce seed to replenish the soil seedbank, and reduce likelihood of further recruitment or regeneration.
Habitat loss and fragmentation		
Logging	potential future	Areas adjacent to the lower altitude sub-populations have been logged. Most individuals are now included in the Mount Elizabeth Nature Conservation Reserve, which was gazetted in 2004.

Conservation Actions

Conservation and Management priorities

Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the leafy nematolepis rather than degrade the habitat necessary to the leafy nematolepis, that they do not promote invasion of exotic species, and that they do not increase impacts of grazing/predation.
- Physical damage to the habitat and individuals of leafy nematolepis must be avoided during and after fire operations.
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the leafy nematolepis.

Habitat loss disturbance and modifications

- Control threats from logging using increased buffer zones. Buffer zones to be determined through surveying habitiat to determine an appropriate buffer size.

Seed collection, propagation and other ex situ recovery action

- Establish plants in cultivation in appropriate institutions such as the Royal Botanic Gardens Victoria.
- To manage the risk of losing genetic diversity, undertake appropriate seed and storage in appropriate institutions, such as the Victorian Conservation Seedbank and Royal Botanic Gardens Victoria, and determine viability of stored seed. Best practice seed storage guidelines and procedures should be adhered to, to maximise seed viability and germinability. Seeds from all natural populations to be collected and stored.
- Establish cultivated plants ex situ for inclusion in living collections to safeguard against any unforeseen destruction of wild populations.
- Ex situ seed banks provide an important capacity for medium to long-term storage of diaspores of threatened plant species. Where storable diaspores (seeds, spores, dispersal units) are available seed banking should be undertaken in consultation with relevant seed storage professional advice as to appropriate conditions (collection and post-harvest treatment; pre-storage drying; storage temperature; curation and auditing) to ensure diaspore viability is retained.
- 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.

Survey and Monitoring priorities

- Acquire baseline population data by conducting detailed field surveys including (a) identification of the area and extent of population; (b) estimates of the number, size and structure of population and (c) inference or estimation of population change.
- Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition.
- Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference.
- Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment.
- Monitor the size, structure and reproductive status of populations at different stages in the fire cycle, taking opportunities to monitor after planned and unplanned fires (where they occur) and improve understanding of the fire response of the species.
- Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data.
- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the leafy nematolepis.

Information and research priorities

- Improve understanding of the mechanisms of response to different fire regimes and identify appropriate fire regimes for conservation of the leafy nematolepis.
- Where appropriate, use understanding and research on fire responses 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.
- Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration.

References cited in the advice

DEH (2000) Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of the Environment and Heritage, Canberra.

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