

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Minister's delegate approved this Conservation Advice on 15/07/2016.

Conservation Advice

Zieria adenophora

Araluen zieria

Conservation Status

Zieria adenophora (Araluen zieria) is listed as Endangered 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 Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth). The species is also listed as Critically Endangered under the *NSW Threatened Species Conservation Act 1995*.

The main factors that are the cause of the species being eligible for listing in the Endangered category are, the species occurs at a limited location with a very restricted extent of occurrence/area of occupancy, and a very low total number of mature individuals. Impacts of trampling by feral goats (*Capra hircus*) also hinder the resilience of the Araluen zieria to withstand drought conditions.

Description

Araluen zieria is a shrub to 1 m tall with warty branches. The clover-like (trifoliate) leaves are arranged in pairs on short stalks along the stems. Their upper surfaces are slightly warty; the lower surfaces are hairy. The small flowers are white or pale pink with petals to 3 mm long (OEH 2015).

Distribution

Araluen zieria has a very restricted geographic distribution. In 2015, the species was known from only a single population of fewer than 200 individuals occurring at Bells Creek in the Araluen Valley in the Southern Tablelands of New South Wales (NSW) (OEH 2015; OEH 2016). The population consists of two subpopulations located approximately 100 m apart, above and below a 20 m high rock face which separates them. The species' extent of occurrence and area of occupancy is known to be less than 4 km² (OEH 2015), consistent with the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN 2014), based on 2 x 2 km grid cells.

The Araluen zieria was first recorded (and a specimen collected) near Araluen in 1888 and described by Blakely (1941). The species was not recorded again for approximately another 100 years and was considered extinct (Briggs & Leigh 1990) until it was rediscovered in 1988. At the time of discovery of the Araluen zieria in 1888, it was noted that there was only a single plant present on the site of collection suggesting that the occurrence of the species was historically rare during early European settlement (NSW NPWS 2001).

There are two other historic records of the species, one from 'near the Clyde (River)' in 1889 and the other from 'some of the remotest sources of (the) Murrumbidgee (River) at Maneroo' in 1888. However, given that the descriptions of the localities of these records are imprecise, it is difficult to conduct specific searches for these sites (NSW NPWS 2001). Searches in the Araluen area on the Clyde and Sugarloaf Mountains in 1988 failed to locate the species there (OEH 2015).

Live specimens are also on display in the Australian National Botanic Gardens in Canberra.

Relevant Biology/Ecology

Little is known about the ecology of the Araluen zieria. It occurs in shrubby vegetation growing in shallow sandy to gravelly loam, amongst large granite boulders and tors on the steep upper slopes of a hillside with a north-westerly aspect (Briggs & Leigh 1990; OEH 2015). The species grows in a shrub community on the margins of *Eucalyptus maidenii* (Maiden's Gum) low open-forest. The shrub community consists of *Acacia mearnsii* (black wattle), *Dodonaea viscosa* (sticky hop bush), *Correa reflexa* (native fuchsia), *Ficus rubiginosa* (rusty fig), *Notelaea venosa* (large mock olive), *Plectranthus parviflorus* (cockspur flower) and *Poa sieberiana* (grey tussock-grass).

Araleun zieria reaches maturity at around five years and flower prolifically from August to October (NSW Scientific Committee 2008). The species is pollinated by insects and fruits develop and ripen rapidly. An abundance of seed is produced, the majority of which is shed by the end of December (NSW NPWS 2001; OEH 2015). Numerous seedlings have been observed in the wild following plentiful seasonal rainfall and in the absence of soil disturbance by feral goats. The average longevity of individuals in the wild is estimated to be 10 - 15 years (OEH 2015).

The sensitivity and response of the Araluen zieria to fire is unknown. The species shows little evidence of resprouting from the bases of stems or rootstocks following die-back caused by drought. While individuals of the species are likely to be destroyed by fire, given that the species is a prolific seeder, it is likely that germination occurs from soil-stored seed bank.

Threats

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

Threat factor	Threat type and status	Evidence base
Invasive species		
Trampling by feral goats	known current	Trampling and habitat degradation by feral goats has been observed to be a threat to species recruitment. Feral goats are also believed to have damaged the soil profile in the upper subpopulation area, exacerbating the impacts of drought on species recruitment.
Breaches to exclusion fence	known current	Both subpopulations are contained within a single exclusion fence to restrict access from feral goats (Briggs pers. comm., 2016). Infrequent inspection of the exclusion fence may result in feral goats having access for extended periods of time.
Climatic Change		
Increased frequency and intensity of drought as a result of global climate change	known current	Drought is known to have severely affected this species, causing a significant decrease in number of mature individuals in the upper section of the population. Damage by feral goats lower the resilience of the population to drought
Fire		
Increased frequency and intensity of wildfires as a result	potential	Climate change will affect fire regimes in Australia through the effects of changes to temperature, rainfall, humidity, wind – the fire weather components – and through the effects of increases in atmospheric CO ₂ , and

of global climate change		changes in moisture, on vegetation and, therefore, fuels (Williams et al., 2009). It is unknown whether the Araluen zieria is fire tolerant, although standing plants are killed by fire in several congeners. While it would be unlikely, given the rocky, sparsely vegetated site on which the Araluen zieria population occurs, for a single wildfire to destroy the entire extent of the species' occurrence, the potential for this to occur does exist (NSW NPWS 2001).
Land Management		
Crown land licensing	potential	Part of the population occurs on Crown leasehold land. It is possible that future changes in ownership or land use, for example land clearing and site development, could put the survival of the population at additional risk.
Private land tenure	potential	Part of the population occurs on private land. Future changes in land use, for example land clearing and site development, could put the survival of the population at additional risk.

Conservation Actions

Conservation and Management priorities

Invasive species

- Continue to maintain and routinely inspect exclusion fencing at the site to ensure integrity and effectiveness in preventing access by feral goats.

Climatic change

- Ensure minimal disturbance to Araluen zieria habitat by restricting access by feral goats and any other ungulates that may potentially unearth plants and expose roots to dry conditions.

Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the Araluen zieria, that they support rather than degrade the habitat necessary to the Araluen zieria, that they do not promote invasion of exotic species, and that they do not increase impacts of grazing/predation.
- Exclude prescribed burning operations from both extant sites and, where possible, protect from unplanned fire events.
- Provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plan/s, risk register and/or operation maps.
- As a putative obligate seeding shrub, the following principles should be adhered in the fire management of this species:
 - Ensure that fires do not occur within populations before an accumulation of a seedbank large enough to replace* the number of fire-killed standing plants [*replacement should incorporate expected post-fire rates of seedling survival].

- Ensure that fires do not occur in winter or spring, avoiding the exposure of sub-mature seedling recruits to desiccating conditions.
- Physical damage to the habitat and individuals of the species must be avoided during and after fire operations. The NSW Rural Fire Service recommends no slashing, trittering or tree removal near the species (NSW RFS, 2003, 2013)
- Fire management should be accompanied by a carefully planned weed management strategy to control weeds that are encouraged by burning, and post-fire monitoring should occur around surrounding areas.

Land Management

- o Consider the potential for transferring the ownership of the Crown land to the NSW National Parks and Wildlife Service so that it can be managed as a conservation reserve. Consider the purchase of the section of the species area of occupancy that is currently occurring on private land, land swap or boundary realignment to include extent of *Araluen zieria* habitat within the Crown Land Estate.

Breeding, propagation and other ex situ recovery action

- o Implement a plant material propagation plan to manage the continued collection and storage of seed, and the collection and propagation of plant cuttings from mature individuals of the population in a manner which maintains integrity and diversity of the populations' genetic stock and to insure the species' survival and future recovery in the event of catastrophic droughts or wildfires.

Stakeholder Engagement

- o Ensure current and future land managers are aware of the species' occurrence and provide protection measures against key and potential threats.
- o Encourage the owner of the section of the species area of occupancy that is currently occurring on private land to enter into a Voluntary Conservation Agreement.
- o Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the *Araluen zieria*.

Survey and Monitoring priorities

- Design and implement a monitoring program or, if appropriate, support and enhance existing programs report on changes in population density and extent, and seedling emergence and potential resprouting of stems.
- Monitor the size and 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.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/remnants.

Information and research priorities

- Research key biological functions of the species. Evaluate essential life-history stages, current reproductive/ regenerative status, seed bank status and longevity, fecundity, recruitment levels and mechanisms for recruitment and dispersal.
- Research and assess the ecological requirements of the species in order to address the threat of climate change.
- Investigate options for establishing additional populations.
- Improve understanding of the mechanisms of response to different fire regimes and identify appropriate fire regimes for conservation of the Araluen zieria by undertaking appropriately designed experiments in the field and/or laboratory.

References cited in the advice

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