

# THREATENED SPECIES SCIENTIFIC COMMITTEE

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

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

## Conservation Advice

### *Zieria lasiocaulis*

Willi Willi zieria

#### Conservation Status

*Zieria lasiocaulis* (Willi Willi zieria) is listed as Endangered 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 at that time as, immediately prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

Species can also be listed as threatened under state and territory legislation. For information on the 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 factor that is the cause of the species being eligible for listing in the Endangered category is that the species has a restricted geographic distribution that is precarious for its survival. This precariousness is due to the species distribution occurring at less than five locations and the continuing decline of extent and quality of habitat.

#### Description

The Willi Willi zieria a small tree or shrub. It occurs as a 6 m tall tree in clearings or as shrubby regrowth on the margins of forest (Armstrong, 2002). The branches are dotted with raised oil glands which give off a strong smell when bruised. The branchlets are covered with fine hairs. Leaves consist of three leaflets joining at the top of the leaf stalk. Each leaflet is 40 - 60 mm long and elliptical in shape with a pointed tip. The inconspicuous white flowers form on a short spray between autumn and spring (OEH, 2014a).

The Willi Willi zieria is similar in appearance to the more widespread *Z. arborescens* subsp. *arborescens* and *Z. southwellii*, but can be distinguished by its pubescence, primarily of long simple hairs, on young growth (NSW NPWS, 2002).

#### Distribution

The Willi Willi zieria occurs in the NSW North Coast IBRA bioregion in NSW.

The largest population occurs in the area of the Wilson River's headwaters in Willi Willi National Park (NP), south-west of Kempsey in NSW (OEH, 2014a), where there are 10 000 - 40 000 plants over an area of 16 km<sup>2</sup> (OEH, 2016a). Collections have been made between Mount Banda Banda and Marowin Mountain (NSW NPWS, 2002) and the species occurs at three main sites in the park: the southern escarpment of Mt Banda Banda, on the Main Range and at North Wilson (Armstrong, 2002).

Collections have also been recorded in Mt Boss State Forest (OEH, 2016b) and Willi Willi NP near Kippara State Forest (OEH, 2016b). Unconfirmed records have been made on private land near Kindee (south of Willi Willi NP) (ALA, 2016), Werrikimbe NP (Armstrong and Harden, 1991), New England NP (Armstrong and Harden, 1991) and Barrington Tops NP (OEH, 2016b).

#### Relevant Biology/Ecology

The Willi Willi zieria occurs at mid to high altitude on the coastal escarpment (OEH, 2014b). Sites occur on rocky escarpments, on hill tops and scree slopes, in clearings, along roadsides

and along margins of rainforest (OEH, 2014a). The species is found in the following vegetation associations: northern warm temperate rainforest; subtropical rainforest; cool temperate rainforest; north coast wet sclerophyll forest; and northern escarpment wet sclerophyll forest.

Fire or disturbance events stimulate germination of seeds of this species. As it occurs in areas of large stands of rainforest, wildfire or disturbance is infrequent. Wildfire, wind throw of trees, soil slip or erosion are types of natural disturbance that may stimulate germination (NSW NPWS, 2002). Regeneration occurs from the soil seed bank; some germination apparently occurs independently of disturbance (NSW NPWS, 2002). There is evidence of the NSW Government facilitating mechanical disturbance within 25 m<sup>2</sup> plots (OEH, 2014), however, at this time there is no available data on the response of this species to the treatment.

## Threats

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

Threat factor	Threat type and status	Evidence base
Fire and non-fire habitat disturbance		
Fire and habitat disturbance frequency	potential current	Too frequent disturbance (e.g. less than an interval of five years) that does not allow plants to sexually mature (and replenish the seed bank) may cause local extinction, however, there is no referenced study to confirm this or demonstrate the impact.  Too infrequent disturbance that allows plants to senesce may cause local extinction, however, there is no referenced study to confirm this or demonstrate the impact.
Fire and habitat disturbance intensity	potential current	High intensity disturbance may detrimentally impact soil seed bank dynamics and long term sustainability of sites. Low intensity disturbance may be insufficient to stimulate germination and may result in population decline if adult plants are killed (NSW NPWS, 2002).
Roads		
Road construction and maintenance	potential current	Track construction and maintenance may detrimentally impact the species (OEH, 2014a).
Disease		
Dieback caused by root rot fungus ( <i>Phytophthora cinnamomi</i> )	potential current	This species is susceptible to dieback caused by root rot fungus (OEH, 2014a).
Timber harvesting		
Habitat disturbance	known past	Prior to declaration of Willi Willi National Park, habitat disturbance associated with forest operations occurred in the species habitat. During this period, fire frequency may also have been increased (NSW NPWS, 2002).

## **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 species; do not degrade the species habitat; and do not promote invasion of exotic species.
- Identify the range of variation in fire frequency that promotes persistence of the species and apply this knowledge to intervals between prescribed fire events (if such fires are deemed necessary). The NSW government recommends a fire interval of 10 to 25 years (OEH, 2014a) and, in relation to hazard reduction burning, the NSW Rural Fire Service recommends a fire frequency of no more than once every 12 years (NSW RFS, 2013).
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the species. Land managers should be given information about managing fire for the benefit of the species.
- As an 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.

#### Habitat disturbance

- Liaise with relevant land managers to protect habitat from road construction and maintenance (OEH, 2014a), particularly accidental damage on the edges of roads/tracks (OEH, 2016a).
- Manage disturbance to encourage regeneration of the species (OEH, 2016a).

#### Disease

- Control access routes and maintain track closure signage to reduce the risk of spread of root rot fungus into sites.
- Implement suitable hygiene protocols including vehicles and boots washed down and treated with appropriate hygiene materials (e.g. boots sprayed with methylated spirits solution or bleach) prior to entry to a site to protect known populations from entry of root rot fungus into sites (OEH, 2016a). There is evidence of NSW Government staff adhering to hygiene protocols (OEH, 2014c).

#### Breeding, propagation and other ex situ recovery

- Collect seed and curate in a seed bank for preservation of the species and use in translocation projects. Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment.

### **Survey and Monitoring priorities**

- Regularly monitor the species abundance, extent and condition to determine population trends through time. Monitor the extent and severity of threats to assess the effectiveness of management actions. Adapt, add or remove management actions in response to monitoring results to maximise the effectiveness of conservation measures (OEH, 2016a). Permanent plots were established in 2001 (NSW NPWS, 2002), however, it is unknown whether data has continued to be collected at these sites.
- 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.
- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the species.
- Undertake targeted and opportunistic surveys in suitable habitat and potential habitat to locate any additional occurrences (NSW NPWS, 2002). Notify the NSW Government of any new occurrences of *Willi Willi zieria* (OEH, 2014a). If the species is discovered on private property, assess threats to the subpopulations and adapt, add or remove management actions in response.

### **Information and research priorities**

- Develop a list of features that distinguish the species from other *zieria* species and distribute amongst appropriate land managers of known and potential habitat (NSW NPWS, 2002).
- Improve understanding of the mechanisms of response to different fire regimes and identify appropriate fire regimes for conservation of the species by undertaking appropriately designed experiments in the field and/or laboratory. 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.
- Undertake research into the following topics and, using the findings, adapt management actions as necessary (NSW NPWS, 2002):
  - determine seedling survival, plant longevity and the species juvenile period.
  - flowering, pollination and seed set.
  - seed bank dynamics, particularly the time required to establish an adequate seed bank and the effect of different disturbance regimes on the seed bank.
  - mortality rates, particularly of seedlings after a germination event.
  - response to physical disturbance.

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