

NSW SCIENTIFIC COMMITTEE

Zieria parrisiae J.D. Briggs & J.A. Armstrong (Rutaceae)

Review of Current Information in NSW

June 2008

Current status:

Zieria parrisiae (Parris' *Zieria*) is currently listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that *Zieria parrisiae* meets criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act* 1995 (TSC Act), based on information contained in this report and other information available for the species.

Species description:

Zieria parrisiae is described in Armstrong (2002) as follows: "A many-branched shrub up to 3 m; younger branches not ridged, densely tuberculate, pubescent all over with short stellate hairs, the stems and tubercles often with a reddish tinge; older branches becoming etuberculate, glabrescent. Leaves palmately trifoliolate, opposite, petiolate. Petiole (1.5) 2.0-4.0 (5.0) mm long, densely tuberculate, with a dense velvety indumentum of very short stellate hairs. Central leaflet narrow oblanceolate-lanceolate (18) 25-35 (44) x (1.5) 3.0-4.0 (5.5) mm, dark green above, paler green beneath; upper surface densely tuberculate, pubescent with very short stellate hairs; the primary vein deeply sunken, the secondary veins slightly sunken; lower surface densely tuberculate, with a dense velvety indumentum of short stellate hairs; apex acute to obtuse; margin somewhat dentate (because of the large tubercles), recurved; primary vein prominently raised, densely tuberculate and densely stellate-pubescent, secondary veins slightly raised and less conspicuous. Secondary leaflets similar to central leaflet but smaller, usually 0.75-0.85 times as long. Inflorescence axillary, almost as long as the leaves (3) 9-24 (33)-flowered. Peduncle (3) 10-15 (16) mm long, densely tuberculate, densely pubescent with short stellate hairs. Bracts generally deciduous (only one bract or bracteole present at each node of the inflorescence), narrow lanceolate to oblanceolate, 2.0-5.0 x 0.5-1.0 mm, tuberculate on the lower surface only, moderately to densely stellate-pubescent, foliaceous but very much smaller. Pedicel terete, 2.5-5.0 mm long, sparsely tuberculate, moderately pubescent with very short stellate hairs. Flowers white, conspicuous, 7.0-9.0 mm diameter. Calyx lobes deltoid, 1.3-1.8 x 1.0-1.3 mm, very much shorter than the petals, tuberculate and stellate hairy on the outer surface, etuberculate and glabrous on the inner surface. Petals imbricate in bud, ovate-elliptic, 4.0 x 2 mm with a small inflexed mucro at the apex, both surfaces with a fine pubescence of very short stellate hairs. Stamens not persisting in the fruiting stage; filaments 1.5-1.8 mm long, glabrous, not warty or tapering; anthers 0.7 x 0.6 mm, not apiculate, attached in the lower third, deep orange in colour (cream in dry state). Disc interrupted and distinct, glabrous, white. Ovary not tuberculate, glabrous. Style c. 0.5 mm long, glabrous. Stigma 0.3 mm broad, lobed. Fruit reddish-brown when immature, becoming green at maturity, densely tuberculate on carpel surface, glabrous. Cocci lacking an appendage. Seed grey to grey-brown, striate, 1.8 x 1.3 mm; covering to the raphe

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shiny black, not striate. Seed surface: ridges well-developed, flattened and not prominent, short; branches and cross-ridges common, wax present. Elaiosome 1.3 x 1.0 mm.”

Taxonomy:

Zieria parrisiae was first discovered in 1986 and described by J. D. Briggs & J. A. Armstrong. The species has been known by a number of informal names, including ‘Z. sp. I’ (Armstrong 1991), ‘Z. sp. 15’ (Briggs & Leigh 1988) and ‘Z. sp. Q (Box Range North)’ (expert advice). *Zieria parrisiae* is distinguished from closely related *Z. buxijugum* and *Z. formosa* by the less velvety coverage of stellate hairs on the upper surface of its leaves, and from *Z. tuberculata* by the presence of prominent warts in its fruits.

Distribution and number of populations:

Zieria parrisiae is known from only one population located west of Pambula on the far south coast of NSW (NSW NPWS 2002; Armstrong 2002). The population is split into two main patches located about 200 m apart along a small gully with a third, smaller patch in between (NSW NPWS 2002).

The population of *Z. parrisiae* occurs on private freehold land zoned for rural use (NSW NPWS 2002). It is adjacent to State forest and nearby to grazing land (Briggs & Leigh 1990). The species is not known to occur in a conservation reserve (Briggs & Leigh 1996).

Extensive surveys of similar habitat in the area by several botanists have not located any other populations (Briggs & Leigh 1990; expert advice 2008).

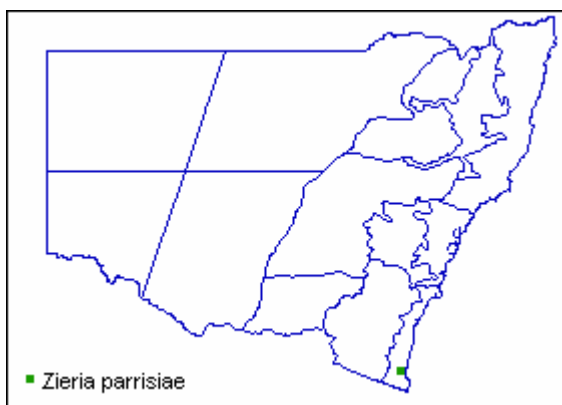


Figure 1. Location of *Zieria parrisiae* in NSW.

Ecology:

Key habitat requirements

The only known population of *Z. parrisiae* occurs on the side of a north facing steep ignimbrite rock outcrop above a small creek (Briggs & Leigh 1990; NSW NPWS 2002; Armstrong 2002). This species grows in skeletal, grey, sandy loam amongst broken rhyolite rocks and boulders (Briggs & Leigh 1990; NSW NPWS 2002). The species occurs in an ecotone between shrubby

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heath and open dry sclerophyll forest. The shrub community is dominated by *Melaleuca armillaris*, *Kunzea ambigua* and *Acacia mearnsii*. Other associated species include *Cassinia longifolia*, *Plectranthus parviflorus*, *Commersonia fraseri*, *Platysace lanceolata* and *Dendrobium speciosum*. The adjacent open forest is dominated by *Eucalyptus muelleriana* and *E. sieberi* (Briggs & Leigh 1990; NSW NPWS 2002; Armstrong 2002).

Life history

Zieria parrisiae flowers prolifically between late September and early November (Briggs & Leigh 1990; NSW NPWS 2002; Armstrong 2002). It is thought to be pollinated by insects such as native bees, hover flies and blowflies (NSW NPWS 2002). Fruits develop quickly and by the end of December the majority of the seed has been dispersed (NSW NPWS 2002; Armstrong 2002). Plants have been observed to resprout after defoliation following browsing.

There are few data on the longevity of this species in the wild, as individuals have not been regularly monitored, but several larger plants identified in 1986 were still thriving in 2001. Because of the large size of these plants (in 2001 the larger plants were approximately 4m tall) and slow growth, this species is thought to live for 30 to 50 years, possibly longer (NSW NPWS 2002; expert advice). The age to maturity is estimated to be 10 years (expert advice). From this the generation length (IUCN 2008) can be estimated to be around 20 to 30 years.

Number of mature individuals:

When this species was first surveyed in 1987, the population consisted of only four adults (*i.e.* plants greater than 1 m in height) that had not been browsed down to ground level by goats and wallabies (Briggs & Leigh 1990). The goats were removed from the site in the late 1980s and guards were placed around a few individual younger plants in 1999 to protect them from wallaby browsing (Armstrong 2002; NSW NPWS 2002). When resurveyed in April 2001 the population had increased to 36 adult plants (plus 85 smaller plants) (NSW NPWS 2002; Armstrong 2002). Although this was a large increase in the adult population, NSW NPWS (2002) reported that only half of these plants were larger than 1.5 m, and appeared unlikely to be contributing substantially to seed production.

In 2002 the whole site was fenced to exclude wallaby browsing (expert advice). No population estimate is available after 2001. If the fence still remains intact, the population is expected to have increased (expert advice 2008).

Threats:

The major ongoing threat to this species is browsing by Swamp Wallabies (*Wallabia bicolor*). This reduces the survival and growth of younger plants and seedlings, as new growth is ‘nipped off’, preventing recruitment into the adult population (Armstrong 2002; NSW NPWS 2002).

Goats were a threat to the species in the mid-1980s and had a major detrimental impact, but they have now been removed from the area (Briggs & Leigh 1990; Armstrong 2002; NSW NPWS

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2002). 'Competition and habitat degradation by Feral Goats, *Capra hircus*' is listed as a Key Threatening Process under the TSC Act in NSW.

The low numbers of large, reproductively mature plants and the extremely small area occupied by the species places *Z. parrisiae* at a very high risk of extinction from stochastic events such as wildfire, drought, and severe browsing by native and non-native animals (NSW NPWS 2002).

The response of *Z. parrisiae* to fire is not known (NSW NPWS, 2002), although many *Zieria* species are killed by fire and particular fire regimes may threaten the species.

In 1999 some plants (in particular young ones) were found to be damaged by leaf-eating insects. There was less impact by these when surveyed in 2001.

Summary of recovery actions that have been implemented:

- In 1987/88 goats were removed from the site
- In 1999 wire mesh guards were installed around some of the younger plants to protect them from wallaby browsing.
- In 2002 a fence was constructed around the entire site to exclude wallabies.

Extreme fluctuations:

There is no information/evidence of this species experiencing extreme fluctuations in habitat or population size.

Population reduction and continuing declines:

The size of the population of *Z. parrisiae* was unknown before goats apparently decimated it in the mid 1980s. When Briggs & Leigh (1990) first surveyed this species, in addition to the four healthy adults, they also found 35 other larger plants that had been 'browsed and smashed down to near ground level'. So it is likely the population would have been at least 39, equating to a 90% reduction. The elimination of goats resulted in about a 90% increase by 2001.

The current population is unknown, however as a result of fencing the entire population in 2002, it is likely that the population would now have increased. Because the integrity of the fence is rarely assessed there remains a risk of future decline as a result of wallaby browsing.

Extent of Occurrence (EOO) & Area of Occupancy (AOO):

NSW NPWS (2002) states 'the population is split into two main patches located about 200 m apart along a small gully. A third, smaller patch is located between the two larger patches'. These patches vary in size from 1-6 ha (expert advice). The entire population of the species therefore falls within a single 2 x 2 km grid cell, the spatial scale recommended for estimation of AOO by IUCN (2008).

The EOO and AOO are thus estimated to be less than 4 km².

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Severe fragmentation:

All individuals are found in one small subpopulation. This species is not considered to be severely fragmented.

References:

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- Armstrong JA (2002) *Zieria* (Rutaceae): a systematic and evolutionary study. *Australian Systematic Botany* **15**, 277-463.
- Briggs JD, Leigh JH (1988) 'Rare or Threatened Plants: 1988 Revised Edition.' (Australian National Parks and Wildlife Service: Canberra)
- Briggs JD, Leigh JH (1990) 'Delineation of Important Habitats of Threatened Plant Species in South-Eastern New South Wales.' (Australian Heritage Commission: Canberra)
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- IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.' (Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland)
(<http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf>).
- NPWS (2002) 'Draft Recovery Plan for *Zieria formosa*, *Zieria buxijugum* and *Zieria parrisiae*.' NSW NPWS, Hurstville.

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au.

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) *Zieria parrisiae*. Review of current information in NSW. June 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.