

NSW SCIENTIFIC COMMITTEE

Caladenia tessellata Fitzg. (Orchidaceae)

Review of Current Information in NSW

May 2008

Current status:

Caladenia tessellata is currently listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that *Caladenia tessellata* meets criteria for listing as 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:

Caladenia tessellata is described in Bernhardt (1993) as follows: "Terrestrial herb. Leaf linear to lanceolate, to 6 cm long and 5 mm wide, sparsely hairy. Inflorescence to 25 cm high, rarely >2-flowered, hairy. Sepals and lateral petals c. 2 cm long, cream-coloured with reddish stripes (lateral sepals often crossing); tails short, filiform or merely acuminate, with dark glandular hairs, less than a third of the length of the segments; tails of the lateral petals and lateral sepals often held stiffly and horizontally or petals deflexed. Labellum broad-cordate, 10-15 mm long, 10-20 mm wide, more or less unlobed, yellowish with a few darker striations; margins with thick, short, dark teeth. Central calli thick and dark in 4-6 rows becoming crowded and overlapping towards the base and grading into short rows towards the apex. Column base with 2 prominent yellow glands".

Taxonomy:

Caladenia tessellata was first described by Fitzgerald in 1876 from Sydney. Since then, the taxon has always been widely accepted as a well-defined, distinct species. Jones *et al.* (2001) split the genus *Caladenia* into a number of segregate genera and placed *C. tessellata* into the newly described genus *Arachnorchis*. The generic changes within *Caladenia* have not always been accepted, however, and Hopper & Brown (2004) subsequently published an alternative classification maintaining a broadly defined *Caladenia*. The name *Arachnorchis tessellata* is still recognised in the latest treatment of Australian orchids by Jones (2006) but for the purpose of this report the more widely accepted name of *Caladenia tessellata* will be used. The species was originally listed on the TSC Act as *Caladenia tessellata* and this name is currently recommended by the Council of Heads of Herbaria (CHAH) in their consensus census. In addition, the National Herbarium of NSW is also maintaining a broadly defined *Caladenia* in their collections and therefore also prefer the name of *Caladenia tessellata* (expert advice).

Distribution and number of populations:

A review of the Wildlife Atlas and Yeti databases, as well as all specimens held in the National Herbariums at Canberra (CANB) and Sydney (NSW), was undertaken to determine the distribution of *C. tessellata*. Over 50 populations have been vouchered/recorded throughout southern and central

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NSW. Most of these are relatively old records, however, and many of these populations are now considered to be extinct. The area where *C. tessellata* was first collected and described from, is now completely cleared and no longer contains any remnant vegetation likely to be suitable for the persistence of the species. There are also many other old records from suburban Sydney which were collected from populations that are likely to have been in areas that are now cleared.

A number of botanists and orchid enthusiasts were also contacted to discuss when and where they had seen *C. tessellata*. From these personal communications it would appear that the species is now known with certainty from only two populations on the NSW Southern Tablelands. A small population is known to occur on private property around Braidwood (Hadobas 2007; expert advice) while a second, larger population has recently been found in Morton National Park (NP) (Stephenson 2005; expert advice). A further five populations have been documented in recent times although no plants have been recorded from them for eight to 12 years. Two populations in the Wyong shire are now possibly extinct due to degradation of habitat and severe problems with shrubby overgrowth (expert advice). Plants were regularly seen in both populations in the 1990's, but have failed to be relocated since then, despite regular searches. One population was severely impacted by aerial weed spraying (expert advice) and the area has since become overgrown with native shrubs such as *Casuarina* and *Acacia* spp. Likewise, the habitat at the second population has also become unsuitable due to the proliferation of *Chrysanthemoides monilifera* (Bitou Bush). A small population was found around Ulladulla in 1998, although recent searches failed to find any sign of the species. The area has since become degraded by vehicle tracks and weeds, although it is still possible that the species may exist on site (expert advice). Very small populations were also recorded in Lake Macquarie State Recreation Area (SRA) and Budderoo NP (1999 and 2000 respectively), although no plants have been observed since then.

Little is known about the status of many of the population recorded 50-120 years ago, although species may still persist as suitable habitat still exists in some of the broadly recorded areas (e.g. "Hawkesbury River", "Berowra" and "Sutherland") (expert advice).

Ecology:

Like most Australian ground orchids, *C. tessellata* is a deciduous, perennial herb that regenerates each year from an underground tuber. Flowering is very sporadic with only a fraction of mature individuals flowering each season. Flowering of *C. tessellata* is believed to be strongly promoted by fires the previous summer (Jones 2006) and regular fires may also maintain a more favourable habitat by reducing the shrub layer (expert advice). It is thought however, that the species could potentially survive in dense, shaded areas for up to 30 years without fire (expert advice).

The generation length of the species is potentially 20-30 years. The erratic flowering pattern of *C. tessellata* makes it difficult to detect the species even during suitable flowering times as the species may only be visible as an inconspicuous leaf amongst dense undergrowth. For this reason it is probably inappropriate to assume that populations where no flowers have been observed for several years are extinct.

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Number of mature individuals:

The total number of mature individuals currently known in NSW is approximately 100. This is based on recent counts of about 90 plants in Morton NP (expert advice) and seven plants in the privately owned site around Braidwood (Hadobas 2007). It is likely that more mature adults are present, however, given the difficulty of detecting non-flowering plant as discussed above.

Threats:

Severe weed invasion has probably led to the local extinction of a number of populations of *C. tessellata* (e.g. one site is now highly degraded by weeds such as *Coreopsis lanceolata*) (expert advice). Bitou bush was believed to be a major threat to the population recorded at one site in the 1990's, while native shrubs (*Casuarina* and *Acacia* spp.) are threatening the plants in another site (expert advice). The two extant populations at Braidwood and Morton NP are not believed to be seriously threatened by weeds at the present time, however. 'Invasion of native plant communities by *Chrysanthemoides monilifera*' is listed as Key Threatening Process under the TSC Act in NSW.

An inappropriate fire regime (in particular, the total exclusion of fire) appears to be a threat which itself is related to the proliferation of shrubs discussed above.

In recent times clearing of habitat for development is believed to have led to the local extinction of numerous populations although it is unlikely that future clearing will threaten any of the two known remaining extant populations. If any of the poorly known populations are still extant in the Sydney region (and elsewhere) then clearing for development is a continuing threat. 'Clearing of native vegetation' is listed as Key Threatening Process under the TSC Act in NSW

The population in at one site occurs along a walking track and may be threatened by trampling and illegal orchid collecting, although no plants have been observed there for approximately 10 years.

Extreme fluctuations:

There is no evidence of extreme fluctuations in the populations of *C. tessellata*. The numbers of flowering plants may vary greatly from year to year in response to environmental factors such as rainfall and time since fire, but the number of mature individuals could be relatively stable as many individuals would persist as non-flowering tubers beneath the soil.

Population reduction and continuing declines:

At least two populations of *C. tessellata* are known to have become extinct in the 1990's following destruction of the habitat from development (expert advice). Stephenson (2002) documented the demise of the one population and also described how a population near Jervis Bay was destroyed during the establishment of a pine plantation in 1969. Hadobas (2007) described how the Braidwood population has declined from 200 flowering plants in 1981 to less than 10 flowering plants in 2006. The decline in flowering plants was thought to be related to the severe drought conditions. It remains unclear, however, exactly how many plants may still be alive as dormant tubers which have simply not flowered in recent years. It can be inferred that at least some of the

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historically recorded populations from the Sydney basin have become extinct but the precise extent of the overall population reduction remains unclear.

The two known extant populations are both reasonably secure from habitat destruction but are not necessarily immune from other threatening processes. Given the decline in the Braidwood population, and the likely decline of any plants that may remain in degraded areas, it is reasonable to assume a continuing decline for the species in NSW.

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

If it is assumed that the Central Coast populations of *C. tessellata* are still extant, and that the EOO extends south to the Victorian border (the species is known from just south of the border), then the EOO is estimated to be approximately 19 000 km². A lower bound estimate of the EOO is just 45 km², which is based on just the two known extant populations in NSW. The AOO is estimated to be 8-28 km² depending which populations are included as extant. A small number of populations were all recorded in relatively recent times (eight to 12 years ago) but have not been seen since.

Severe fragmentation:

There is sufficient evidence to infer that the population and habitat of *C. tessellata* is severely fragmented. In the northern part of its range the habitat of *C. tessellata* has been partly cleared and at least one population is thought to have become extinct following clearing for a recent development. A similar situation has occurred in one of the two populations at one site in the southern part of the range. Many populations were recorded in the greater Sydney area between 1883 and 1960 but none of these have been observed since and much of the potential habitat has been destroyed and/or fragmented. No populations have been recorded between the central coast and the Illawarra (a distance of at least 180 km) for at least 40 years and this area was once likely to be an important area for *C. tessellata* given the large number of historical records.

References:

- Bernhardt P (1993) *Caladenia*. In 'Flora of New South Wales, Vol. 4.' (Ed. GJ Harden) pp. 196-209. (University of New South Wales Press: Sydney)
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- Hadobas PA (2007) Observations on a population of the orchid (*Caladenia*) *Arachnorchis tessellata*. *The Orchadian* **15**, 376-377.
- Jones DL, Clements MA, Sharma IK, Mackenzie AM (2001) A new classification of *Caladenia* R.Br. (Orchidaceae). *The Orchadian* **13**, 389-419.
- Jones DL (2006) 'A complete guide to native orchids of Australia including the Island Territories.' (Reed New Holland: Sydney)
- Stephenson AW (2002) Threatened orchid species in my backyard. *The Orchadian* **14**, 80-84.

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Stephenson AW (2005) *Arachnorchis tessellata* – a long lost local. *The Orchadian* **14**, 522-525.

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) *Caladenia tessellata* Review of current information in NSW. May 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.