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Prasophyllum fuscum, *P. uroglossum* and *P. pallens* (Orchidaceae)

Review of Current Information

April 2008

Current status:

Prasophyllum fuscum and *P. uroglossum* are currently listed as Vulnerable and Endangered, respectively, under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that based on information contained in this report and other information available for the species, both *Prasophyllum fuscum* and *P. uroglossum* meet criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act* 1995 (TSC Act), and the newly described species, *P. pallens*, meets criteria for listing as Vulnerable in NSW under the TSC Act.

Taxonomy:

There has been considerable confusion in the past surrounding the true identity of *Prasophyllum fuscum* and its relationship with *P. uroglossum*. Recent taxonomic research suggests that plants previously referred to as *P. fuscum* from northern NSW, Victoria and Tasmania are all different, but closely related species. In addition, plants from the Blue Mountains that have traditionally been treated as *P. fuscum* have recently been described as a new species (*Prasophyllum pallens*). The true *P. fuscum* appears to be restricted to a single population alongside a road approximately 25 km north-west of Wollongong. *Prasophyllum uroglossum*, which has often been reduced to synonymy with *P. fuscum*, appears to be a distinct species and is now known only from the margins of Wingecarribee Swamp in the Burrawang district. Records of *P. uroglossum* from elsewhere (e.g. Tasmania) are considered to be erroneous.

Specific information for *Prasophyllum fuscum sens. str.*

Species description:

There are no recent descriptions of *P. fuscum* currently available. Descriptions given of “*P. fuscum*” in various references (e.g. Bernhardt & Rowe 1993; Bishop 1996; Jones 2006) are composite descriptions of at least two taxa and are therefore misleading. The species is very similar to *P. uroglossum* (see description below) but differs by having a much shorter midlobe on the labellum and by having the callus extending well onto the midlobe (expert advice).

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Distribution and number of populations:

The Type specimen of *P. fuscum* is from “Moist meadows towards George's River”, a relatively imprecise location. The only recent collection is from a roadside which is within the upper headwaters of tributaries of the Cataract River, south of the Georges River, and it is possible that this population is close to the original collecting site.

Ecology:

At present, *P. fuscum* is only known to occur along a roadside in moist sandy soil over sandstone (expert advice). Plants occur amongst sedges and grasses in an area that appears to be regularly slashed by the local council. Virtually nothing else is known about the ecology of *P. fuscum* although it is likely to be similar to that discussed for *P. uroglossum* below.

Number of mature individuals:

Around 25 plants were recorded when the species was rediscovered in late 2007 (expert advice).

Threats:

The population of *P. fuscum* occurs along a roadside that appears to be regularly slashed by the local council (expert advice). An inappropriate slashing regime is therefore likely to be a threat to the species although slashing outside of the active growth/flowering stage may actually favour *P. fuscum* by reducing competition from other vegetation. Despite the close proximity to a road, the habitat appears to be in good condition and relatively free of weeds (expert advice.).

Extreme fluctuations:

There is currently no evidence of extreme fluctuations in the population of *P. fuscum*.

Population reduction and continuing declines:

There is currently no evidence of a population reduction or a continuing decline for *P. fuscum*. If the extant Wilton population is different to the Type population, the latter may have gone extinct.

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

Assuming that the original Georges River population is now extinct, the EOO and AOO for *P. fuscum* are both 4 km². This is based on a 2 x 2 km grid, the spatial scale of assessment recommended by the IUCN (2008), although the population itself was observed in a smaller area along a narrow 300 m stretch of roadside (expert advice).

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Severe fragmentation:

There is currently no evidence of severe fragmentation in the population of *P. fuscum*, although it is likely that some fragmentation has occurred given the long history of land clearing in the area.

Specific information for *Prasophyllum uroglossum*

Species description:

Bishop (2000, p. 41) describes *P. uroglossum* as follows: “Leaf to 50 cm long, withered at flowering. Stem slender, to 30 cm, with up to 23 flowers. Flowers with a strong gardenia scent, 8 mm across, pale greenish brown to red-brown with pale margins to sepals and petals. Ovary swollen. Dorsal sepal ovate with tapered apex. Lateral sepals free or united at base, curving backwards, tips fleshy. Petals linear, acute. Labellum ovate with suddenly tapered narrow acute apex, bent back at 90 degrees above the middle, margins smooth; callus plate greenish, strongly raised and deeply channelled to form 2 wing-like ridges, ceasing just beyond the bend. Column appendages weakly S-shaped, remarkably long (3 mm) and reaching almost to bend in labellum”.

Distribution and number of populations:

Prasophyllum uroglossum appears to be endemic to the Burrawang district approximately 40 km south-west of Wollongong. In the past 10 years it has only been recorded from three or four subpopulations along the margins of Wingecarribee Swamp, although historical records indicate that it was once found 5 km to the south and possibly further to the east near Robertson (expert advice). These old herbarium specimens are difficult to identify with certainty, however, and it is possible that these historical records may in fact be of an undescribed species more closely related to *P. appendiculatum* (expert advice). This taxon is known from several populations in the Robertson-Bowral district and looks very similar to *P. uroglossum* when pressed and dried.

Prior to the altered hydrological conditions in Wingecarribee Swamp, *P. uroglossum* was scattered over one large population but severe fragmentation has now led to the isolation and creation of several smaller subpopulations (expert advice).

Ecology:

Prasophyllum uroglossum grows on the margins of a peat swamp, in peat to clay-peat soil at the ecotone between grassy woodland and swamp. It favours open heathland where abundant light is available and where low shrubs such as *Leptospermum obovatum* provide some shelter. It prefers moist but not very wet soils, and thus does not extend into the swamp itself (NPWS 1999). The species has shown to have a preference for growing on slightly raised hummocks with a number of different sedge species (expert advice).

Like most ground orchids, *P. uroglossum* has a dormant phase during summer and resprouts from an underground tuber in autumn to form a short leaf. This leaf may develop further and flower from October to November. The response of the species to fire is unknown but enhanced flowering in the

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season following a fire is common within the genus (Bishop 2000; Jones 2006).

Number of mature individuals:

At least 100 mature individuals of *P. uroglossum* were present in the early 1990's (expert advice). A survey in 2004 however, found only four plants, although not all of the known subpopulations were searched (expert advice). Results from further surveys of *P. uroglossum* over the past three seasons in Wingecarribee Swamp are as follows: 2005 – 80 plants, 2006 – 3 plants, 2007 – 31 plants (expert advice). The variability of these figures is believed to be partly a result of the fact that not all mature plants of *P. uroglossum* necessarily flower each year (expert advice). However, it is believed that there has been a decline in the population of the species (expert advice) (see section on “Population reduction and continuing declines”).

Given the variability of the proportion of mature plants that flower each year there is some degree of uncertainty in estimates of the total number of mature individuals of *P. uroglossum*. A bounded estimate of 40-80 is plausible and assumes that some of the mature individuals recorded from 2005 (or at least the early 1990s) may have died due to a number of threatening processes. It also assumes that about 25% of the plants may not have flowered (or were simply not observed) during the most recent survey last year.

Threats:

The population of *P. uroglossum* around Wingecarribee Swamp is currently threatened by a number of factors. Weed invasion from exotic species such as *Holcus lanatus* (Yorkshire fog) and *Rubus* sp. (Blackberry) is believed to be degrading the existing habitat (NPWS 1999). A major washout/collapse of Wingecarribee Swamp in August 1998 has altered the hydrological conditions to the point where the former habitat of *P. uroglossum* is now very dry and possibly unsuitable for the species (expert advice). This increasing dryness has also favoured the establishment of a number of weedy species that may otherwise be intolerant of the moist conditions. *Prasophyllum uroglossum* has also been threatened in the past by cattle grazing, topdressing and peat mining (NPWS 1999). ‘Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands’ is listed as a Key Threatening Process under the TSC Act in NSW.

A severe fire that burnt deep into the organic layer of the swamp at Wildes Meadow approximately 20 years ago is believed to have caused the local extinction of *P. fuscum* in that locality (expert advice). An inappropriate fire regime may also threaten the plants that remain along the margin of Wingecarribee Swamp. ‘High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition’ is listed as a Key Threatening Process under the TSC Act in NSW.

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Extreme fluctuations:

There is no evidence of extreme fluctuations in the population of *P. uroglossum*. The species has declined in numbers but this is believed to be more a result of reduction due to a number of threatening processes rather than due to natural fluctuations.

Population reduction and continuing declines:

Prasophyllum uroglossum appears to have declined in Wingecarribee Swamp from at least 100 plants in the early 1990's (expert advice) to the present. The Wildes Meadow population is believed to have gone extinct as a result of the severe fire 20 years ago (expert advice). It is also believed that any plants remaining in Wingecarribee Swamp will continue to decline due to the altered hydrology and competition with a number of exotic weeds (expert advice).

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

The EOO and AOO for *P. uroglossum* are both estimated to be 8 km². This is based on the species occupying two 2 x 2 km grids, the spatial scale of assessment recommended by the IUCN (2008). The calculations do not include the Wildes Meadow location as it is no longer an area of known occurrence.

Severe fragmentation:

Prasophyllum uroglossum is believed to have been once more widespread around the margins of Wingecarribee Swamp, but the population is now severely fragmented due to much of the former habitat drying out and becoming unsuitable for the species (expert advice).

Specific information for *Prasophyllum pallens*

Species description:

Jones (2006, p. 211) describes *P. pallens* as follows: "Leaf 200-400 x 3-4 mm. Inflorescence 300-500 mm tall. Spike 60-100 mm long, 15-30-flowered. Flowers crowded, 18-21 x 8-11 mm, pale tawny green to whitish, strong musty scent. Dorsal sepal 9.5-11 x 2.5-3 mm. Lateral sepals free, 9.5-11 x 2.5 mm, nearly straight, parallel with divergent tips. Petals 8.5-9 x 1.3-1.5 mm, projecting forward, pointed. Labellum sharply recurved and constricted near the middle, 10-12 x 5.5-6 mm, pointed. Callus extending nearly to labellum apex, wrinkled towards tip".

Distribution and number of populations:

Prasophyllum pallens is endemic to the Blue Mountains where it is currently known from four extant populations. In addition, the species has previously been recorded in the vicinity of Leura, Bell and Mount Victoria. However, there has been some loss of habitat associated with development in each of these areas since the time that these historical herbarium collections were

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made, and it is therefore uncertain whether these populations still persist. Details of all the known populations are summarised in the table below.

Table 1: Locality and population notes on all known populations of *Prasophyllum pallens*.

Pop.	Location	Last survey	Population notes	Information source
1a	Blue Mountains NP,	4/12/2004	20 mature adults	expert advice.
1b	Blue Mountains NP.	1999	100's	expert advice.
2	Blue Mountains NP.	12/12/1998	20 mature adults	Wildlife Atlas record; expert advice.
3	Blue Mountains NP	1987	"hundreds"	NSW Herbarium specimen; Bishop (2000); expert advice.
4	Blue Mountains	1991	5-10 mature adults	expert advice.
5	Blue Mountains, Leura.	30/11/1904		NSW Herbarium specimen
6	Blue Mountains, Bell.	30/11/1932		NSW Herbarium specimen
7	Blue Mountains, Mt Victoria.	05/12/1890		NSW Herbarium specimen

Ecology:

Prasophyllum pallens grows in dense low heath in moist to wet shallow sandy soils over sandstone (Jones 2000). Altitudes are relatively high and mostly over 900 m. Like many ground orchids, *P. pallens* has a dormant phase during late summer and resprouts from an underground tuber in Autumn to form a short leaf. This leaf may develop further and plants may flower from November to December. The fire response of *P. pallens* is well known, with flowering being strongly promoted by summer fires in the previous season (Jones 2000). Bishop (2000; p. 42) states that "Flowering, while not dependent on fire, is highly erratic: at one locality near Blackheath flowering plants were present in hundreds in 1987, yet in two subsequent seasons it was difficult to find more than 1 or 2".

Number of mature individuals:

It is difficult to estimate the total number of mature individuals of *P. pallens* due to the variable number of plants that flower each season. A lower bound estimate, based on the figures presented in Table 1, would be in the vicinity of 450. It is quite likely that a far greater number of individuals may exist, however, given the large area of suitable habitat reserved in the Blue Mountains National Park (NP).

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Threats:

Three of the known extant populations occur in the Blue Mountains NP and are unlikely to be subject to any threats. It is not known whether any other unreserved populations occur in the Blue Mountains or whether they are facing any particular threats.

Extreme fluctuations:

There is no evidence of extreme fluctuations in the population of *P. pallens*. There have been observations of extreme fluctuations in the number of flowering plants, but this is likely to be as a result of variation in annual leaf emergence related to environmental factors (rainfall, time since fire, etc.) but does not relate to the number of mature individuals which includes non-flowering plants (expert advice).

Population reduction and continuing declines:

There is no evidence of a population reduction or continuing decline for *P. pallens*. Given the high level of clearing and landscape modification in some areas where the species has been previously recorded (e.g. Leura and Mount Victoria) it is possible that some populations may have been destroyed, but there are no data to substantiate this.

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

The EOO of *P. pallens* is estimated to be approximately 140 km² which assumes that the populations recorded from Leura, Bell and Mount Victoria are still extant. If one makes this same assumption then the AOO of *P. pallens* is approximately 28 km². Alternatively, the AOO may be as low as 16 km² if one assumes that only the four recently recorded populations are extant. A bounded estimate of the AOO for *P. pallens* is therefore 16-28 km².

Severe fragmentation:

There is currently no evidence that the population or habitat of *P. pallens* has undergone severe fragmentation. With the possible exception of one site, most of the extant populations are linked up by large areas of undisturbed land in the Blue Mountains NP.

References:

- Bernhardt P, Rowe RR (1993) *Prasophyllum*. In 'Flora of New South Wales. Vol.4'. (Ed GJ Harden) pp. 155-163. (University of New South Wales Press: Sydney)
- Bishop T (1996) 'Field guide to the orchids of New South Wales and Victoria.' (University of New South Wales Press: Sydney)
- Bishop T (2000) 'Field guide to the orchids of New South Wales and Victoria. 2nd edition.' (University of New South Wales Press: Sydney)
- 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

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Biodiversity Assessments Sub-committee: Switzerland).
(<http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf>).

Jones DL (2000) Ten new species of *Prasophyllum* R.Br. (Orchidaceae) from south-eastern Australia. *The Orchadian* **13**, 148-173.

Jones DL (2006) 'A complete guide to native orchids of Australia including the Island Territories.' (Reed New Holland: Sydney)

NSW National Parks and Wildlife Service (1999) 'Threatened Species Information: *Prasophyllum uroglossum*.' Factsheet downloadable from:
http://www2.nationalparks.nsw.gov.au/PDFs/tsprofile_prasophyllum_uroglossum.pdf

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) *Prasophyllum fuscum*, *P. uroglossum* and *P. pallens*. Review of current information in NSW. April 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.