Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Scientific name (common name)

Prasophyllum limnetes (Marsh Leek-orchid)

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list the Marsh Leek-orchid. The nominator suggested listing in the critically endangered category of the list.

The Committee provides the following assessment of the appropriateness of the species' inclusion in the EPBC Act list of threatened species.

This is the Committee's first consideration of the species under the EPBC Act.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **critically endangered.**

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 3 to make it **eligible** for listing as **critically endangered**.

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 4 to make it **eligible** for listing as **critically endangered**.

The highest category for which the species is eligible to be listed is **critically endangered**.

4. Taxonomy

The species is conventionally accepted as *Prasophyllum limnetes* (Marsh Leek-orchid) (D.L.Jones, 2006). It was previously considered to belong to *Prasophyllum pyriforme* (Graceful Leek-orchid) which is no longer recognised as occurring in Tasmania (Jones, 2006).

5. Description

The Marsh Leek-orchid is a small, fleshy, terrestrial orchid with a solitary erect leaf that is 20–35 cm long and 2–4 mm wide. Flowers are densely crowded along a flower spike 8–12 cm long. The flowers are greenish in colour with brown, pink or mauve tones in the labellum (modified middle petal). The labellum is and 6–7 mm long, with broadly flared margins at the base, sharply recurved and constricted near the middle, and with a tail-like tip (Jones, 2006; Jones and Rouse, 2006).

6. National Context

The Marsh Leek-orchid is endemic to Tasmania. It has been recorded only at the Rubicon Sanctuary, near Port Sorell, in the central north of Tasmania, approximately 20 km west of Devonport. The site is approximately 10 m above sea level. It is located within the North West Natural Resource Management Region. This species is listed as endangered (the highest risk category for extant species) under the Tasmanian *Threatened Species Protection Act 1995*.

7. Relevant Biology/Ecology

The Marsh Leek-orchid grows in an ecotone between low-lying marshy heath/sedgeland dominated by rushes and sedges with scattered patches of *Lomandra longifolia* (Spiny-headed Mat-rush) and *Themeda triandra* (Kangaroo Grass), and coastal *Eucalyptus amygdalina* woodland with a heathy/grassy understorey. The Marsh Leek-orchid flowers in late November and December. The species may require disturbance to stimulate emergence and flowering and is currently only found in areas that are slashed or burned regularly. Studies on the related *Prasophyllum correctum* (Gaping Leek-orchid) indicate that plants may not appear every year, and may survive below ground in a dormant state for up to five years (Coates et al., 1999). Orchids, including the Marsh Leek-orchid, have a complex and poorly understood interrelationship with species-specific mycorrhizal fungi and insect pollinators (Jones et al., 1999). Native bees, wasps and beetles are known to be effective pollinators for other *Prasophyllum* species, while some species can also be self-pollinating (Jones et al., 1999). Leek-orchids are not known to reproduce vegetatively and recruitment is from seed. Evidence suggests that the species does not self-pollinate without intervention.

8. Description of Threats

The main threats to the Marsh Leek-orchid are inappropriate disturbance, loss of pollinators and climate change. Historically, decline in the species is likely to have been caused by vegetation clearance and fragmentation; however, the species is now restricted to a reserve where it is protected from these threats.

Long periods without disturbance may lead to prolonged dormancy with increased risk of mortality through depletion of stores of starch in underground tubers. Conversely, burning too frequently (e.g. annually) may adversely affect mycorrhizal fungi communities, rendering the site unsuitable for fungal-dependent orchid species (Brundrett, 2007), including the Marsh Leek-orchid. Slashing at the wrong time of year can damage plants and prevent seed from being produced.

Potential threats include the loss of pollinators and associated mycorrhizal fungi. The Marsh Leek-orchid has a very small population, which may lead to inbreeding problems and increases the species' susceptibility to stochastic events. The small size of the population may also be insufficient to sustain pollinators and associated mycorrhizal fungi.

Climate change is a further potential threat as changes in the rainfall pattern may lead to the habitat becoming unsuitable for the species and associated pollinators and mycorrhizal fungi. As a near-coastal species, the Marsh Leek-orchid is also particularly susceptible to changes in sea level and extreme tidal variations, which may result from climate change.

9. Public Consultation

The information used in this assessment was made available for public exhibition and comment for 30 business days. No comments were received.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **critically endangered** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

There are insufficient data to determine historic or current population trends for the Marsh Leek-orchid. However, it is likely that the species was more widespread prior to the vegetation clearance and fragmentation that occurred since European settlement of the area. The Marsh Leek-orchid is now known from only one population in the Rubicon Sanctuary. Some decline in this population may have occurred, as 12 individuals were recorded in 1999 (DPIWE, 2000) and five individuals were recorded in 2007 (Collier and Garnett, pers. comm., 2007). However, studies on the related Gaping Leek-orchid indicate that plants may not appear every year, and may survive below ground in a dormant state for up to five years (Coates et al., 1999). Therefore, the fewer number of individuals counted in 2007 may be a result of dormancy rather than decline.

It is likely that there has been an historic decline in the species' numbers due to vegetation clearance and fragmentation, which may continue in the future due to current and potential threats, including inappropriate disturbance, loss of pollinators and climate change. However, there are insufficient quantitative data available to judge whether this decline has been very severe, severe, substantial or not substantial, or whether there will be a certain decline in the immediate future. Therefore, the species has not been demonstrated to have met each of the required elements of Criterion 1, and is **not eligible** for listing in any category under this criterion.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

The Marsh Leek-orchid has been recorded at one location in 19 hectares of remnant vegetation in the Rubicon Sanctuary, near Port Sorell, central north Tasmania. The species' distribution is very restricted, as the known population is small and exists within a patch of remnant vegetation surrounded by improved pasture and housing estates. The species also has very specific habitat requirements, growing in an ecotone between low-lying marshy heath/sedgeland dominated by rushes and sedges with scattered patches of Spiny-headed Mat-rush (*Lomandra longifolia*) and Kangaroo grass (*Themeda triandra*), and coastal woodland with a heathy/grassy understorey. This is an unusual habitat (Harris and Kitchener, 2005), and is rare in the near-coastal areas of northern Tasmania (Tonelli, pers. comm., 2007).

The species' area of occupancy is estimated to be a few square metres (Tonelli, pers. comm., 2007). This geographic distribution is considered to be very restricted.

As discussed under Criterion 1, the Marsh Leek-orchid is likely to have experienced an historic decline caused by vegetation clearance and fragmentation and this decline may continue due to current and potential threats, including inappropriate disturbance, loss of pollinators and climate change.

The Committee considers that the Marsh Leek-orchid has a very restricted geographic distribution, which is precarious for the survival of the species due to its likely continuing decline, single location, and current and potential threats. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 2 to make it **eligible** for listing as **critically endangered.**

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either

(a) evidence suggests that the number will continue to decline at a particular rate; or

(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

A survey in 1999 found a total of 12 mature Marsh Leek-orchids (DPIWE, 2000), and a survey in 2007 found only five plants (Collier and Garnett pers. comm., 2007). The Committee considers that for the purposes of this criterion these numbers are very low. Current and potential threats, such as loss of pollinators, inappropriate disturbance and climate change, may cause this number to decline. The geographic distribution is considered precarious for the species' survival, due to its likely ongoing decline, single location and threats.

The Committee considers that the estimated total number of mature individuals of the species is very low and that the number is likely to decline in the future. The Committee also considers that the species' geographic distribution is precarious for its survival. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 3 to make it **eligible** for listing as **critically endangered**.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

A survey in 1999 found a total of 12 mature Marsh Leek-orchids (DPIWE, 2000), and a survey in 2007 found only five plants (Collier and Garnett pers. comm., 2007).

For the purposes of Criterion 4, the Committee considers that the estimated total number of mature individuals of the species is extremely low. Therefore, the species has been demonstrated to have met the required elements of Criterion 4, to make it **eligible** for listing as **critically endangered.**

Criterion 5: Probability of extinction in the wild that is at least:

a) 50% in the immediate future; or

b) 20% in the near future; or

c) 10% in the medium-term future.

There are insufficient data available to estimate a probability of extinction of the species in the wild over a relevant timeframe. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Conservation Status

The Committee considers that there may have been a decline in the number of mature individuals but notes that there are insufficient data to judge the extent of any decline. The Committee accepts that the area of occupancy is a few square metres, which represents a very restricted geographic distribution. This geographic distribution is considered precarious for the survival of the species given its likely ongoing decline, single location and current and potential threats. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

The Committee accepts that two surveys undertaken since 1999 have found between five and 12 mature individuals. This is judged by the Committee to be very low for the purposes of Criterion 3. Given that its geographic distribution is also precarious for its survival, the species has been demonstrated to have met sufficient elements of Criterion 3 to make it **eligible** for listing as **critically endangered.**

The total number of mature individuals is judged by the Committee to be extremely low for the purposes of Criterion 4. The species has been demonstrated to have met sufficient elements of Criterion 4 to make it **eligible** for listing as **critically endangered.**

The highest category for which the species is **eligible** to be listed is **critically endangered.**

Recovery Plan

The Committee considers that there should not be a recovery plan for this species.

The Tasmanian Government is implementing a Flora Recovery Plan: Threatened Tasmanian Orchids 2006-10 (DPIW, 2006b) which addresses the Marsh Leek-orchid under its former name (*Prasophyllum pyriforme*). A recovery plan has not been recommended because the existing plan does not need review until 2011. A decision to have a recovery plan should be revisited at this time. The actions covered by the conservation advice are considered to be sufficient at this time.

12. Recommendations

(i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the **critically endangered** category:

***Prasophyllum limnetes* (Marsh Leek-orchid)**

(ii) The Committee recommends that there should not be a recovery plan for this species.

Associate Professor Robert J.S. Beeton

Chair

Threatened Species Scientific Committee

13. References cited in the advice

Brundrett MC (2007). Scientific approaches to Australian temperate terrestrial orchid conservation. Australian Journal of Botany 55: 293–307.

Coates E, Lunt I and Wapstra H (1999). Draft Recovery Plan 2000-2003 *Prasophyllum correctum* (Gaping leek-orchid). Unpublished report to Environment Australia. LaTrobe University, Bundoora.

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