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. Name

Nematoceras dienemum

The species is commonly known as the Windswept Helmet-orchid. It is in the family Orchidaceae.

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list the Windswept Helmet-orchid. The nominator suggested listing in the 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**.

4. Taxonomy

The species is conventionally accepted as *Nematoceras dienemum* (Windswept Helmet-orchid) (Jones et al., 2002) by the Council of Heads of Australasian Herbaria (CHAH, 2007).

Nematoceras dienemum was previously known as *Corybas dienemus*.

5. Description

The Windswept Helmet-orchid is a small (3–5 cm tall), tuberous terrestrial orchid, which forms small clonal groups. Its leaves are flattish, fleshy and solitary with dark green colouring above and silvery-green colouring below. The flowers are erect and green with purplish-red markings (Clements and Jones, 2007).

6. National Context

The Windswept Helmet-orchid occurs at ten locations on the northern half of Macquarie Island, 1500 km south-east of Hobart, Tasmania.

The Windswept Helmet-orchid is found on the lower coastal terraces (less than 30 m above sea level) of the island and peat wetland where the vegetation is dominated by mosses which float on a waterlogged underlayer. The soil substrate is waterlogged peat where the water table is very close to the soil surface (Clements and Jones, 2007).

The mire vegetation is dominated by sedges, *Isolepis aucklandica* (New Zealand Club-sedge) and *Juncus scheuchzeroides*; small herbs, *Epilobium pedunculare* (Rockery Willowherb) and *Hydrocotyle novae-zeelandiae*; cushion plants, *Colobanthus muscoides* and *Colobanthus affinis* (Alpine Colobanth); and bryophytes (Clements et al., 2007). The species can also occur on the boundary of mire and herbfield where it grows beneath the megaherb *Stilbocarpa polaris* (Macquarie Island Cabbage) (Copson, 1984). This ecotone is common on the north-west coast raised beach platform on Macquarie Island.

The Windswept Helmet-orchid is not currently listed under any Australian or State Government legislation.

7. Relevant Biology/Ecology

The Windswept Helmet-orchid flowers from November to January (Shaw, 2005). It produces seeds annually and has the capacity for vegetative reproduction. Vegetative reproduction, through production of daughter root-tubers on lateral, underground and elongate stolons, is the most common form of reproduction in the *Nematoceras* genus (Clements et al., 2007). Leaves die off each autumn and new leaves emerge in spring from existing stems and root-tubers (Shaw, 2005). The life expectancy and age of sexual maturity of the Windswept Helmet-orchid are unknown. However, given the capacity for vegetative reproduction it is likely that some clonal patches (colonies) have existed for several decades.

The pollination method for the Windswept Helmet-orchid is unknown. One possible pollinator is the Black Fungus Gnat (*Bradysia watsoni*), which is common on the coastal terraces where the Windswept Helmet-orchid is found (Davies and Melbourne, 1999).

8. Description of Threats

The main identified threats to the Windswept Helmet-orchid are rabbits and seal wallows. The main potential threat to the species is from climate change.

Rabbits are widespread across Macquarie Island, including in short herb vegetation and in grasslands. In 2008, rabbit numbers were estimated to be over 100 000 on an island that is approximately 34 km long and 5.5 km wide (PWS, 2008). Rabbits have not been observed to directly graze on the Windswept Helmet-orchid and prefer not to place their burrows in wet areas where the species is found (Clements, pers. comm., 2009). However, rabbits do dig and scratch at the soil surface causing plants to be dislodged and left to die on the soil surface (Shaw, 2005). Rabbit diggings also destabilise the peat soils causing land slips and the degradation and destruction of Windswept Helmet-orchid habitat. In addition, where rabbits are active they deposit large (50 cm x 50 cm) piles of scats. The impact of nutrient deposition from scats has not been quantified, but it is likely that over time the release of nitrogen from scats will alter soil nutrient processes. Decomposition processes are slow in the subantarctic and piles of scats can smother individuals or small colonies leading to plant mortality.

Studies have shown that rabbit activity (grazing and burrowing) alters vegetation structure and composition (Copson and Whinam, 1998), and may promote introduced grass species, such as Marchantia (liverworts) and *Poa annua* (Winter Grass), which have the ability to outcompete smaller species, including the Windswept Helmet-orchid. In addition, the removal of covering plants, such as *Stilbocarpa polaris* (Macquarie Island cabbage) and *Pleurophyllum hookeri* (Silver leaf Daisy), poses an indirect threat to the Windswept Helmet-orchid, increasing erosion and the exposure of the species to the elements.

Current estimates indicate that rabbit population numbers are broadly stable, with a possible shift of abundance from coastal areas to plateau areas. With the implementation of the Macquarie Island Pest Eradication Project it is envisaged that the threat posed by rabbits to the Windswept

Helmet-orchid will be diminished in the future. Aerial baiting, which is scheduled for winter 2010 is likely to remove in excess of 95% of the rabbit population. Hunting of the surviving rabbits is expected to eradicate the surviving rabbits.

Climate change is having a significant effect on Macquarie Island with an increase in temperatures of >0.5°C in the past 50 years (DEW, 2007). As the Windswept Helmet-orchid only occurs in moist areas, shaded by larger plants, any drying out of these areas is likely to negatively impact on the species. Any sea level rise or increase in storm surges would also have a detrimental effect on this species in the short term. However, in the longer term it would be expected that the species would move above the tidal zone.

Seals are known to utilise low lying areas, such as some of the locations where the Windswept Helmet-orchid is found, where they wallow in the water or mud causing the trampling or destruction of orchid habitat. A 50% reduction in the area covered by the species at Bauer Bay, in the ten year period to 2007, is thought to be primarily as a result of the development of a seal wallow in the species' habitat, as well as the impact of rabbits on the site. The species has been observed to recolonise the edges of this seal wallow and is showing some tolerance to this disturbance.

9. Public Consultation

The nomination 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

The total population numbers for the Windswept Helmet-orchid are approximately 7500 plants. From 1997 to 2007 there was a 50% reduction in the area of occupancy of the species at one location at Bauer Bay. This decline was primarily caused by the development of a seal wallow, as well as to a lesser extent, disturbance by rabbits. It is estimated that up to 500 orchids were killed during this period. The species has been observed to recolonise the edges of this seal wallow and is showing some tolerance to this disturbance. Identified threats to the species may have caused a decline in population size at other locations apart from Bauer Bay; however, there are no data available regarding declines at other locations on the island. Given the total population is approximately 7500 plants, the loss of approximately 500 individual orchids does not represent a substantial reduction in numbers.

Current information suggests that the population size may actually increase in the future if the implementation of the Macquarie Island Pest Eradication Plan is successful in eradicating rabbits from Macquarie Island.

The Committee judges that the species has not undergone, is not suspected to have undergone, and is not likely to undergo at least a substantial reduction in numbers. Therefore, as the species has not been demonstrated to have met any of the elements of Criterion 1, it 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 species' extent of occurrence is approximately 45 km^2 and the area of occupancy is about 1.5 km^2. The Committee considers the geographic distribution of the Windswept Helmet-orchid to be very restricted.

The Windswept Helmet-orchid is only known from ten locations on the northern half of Macquarie Island, which is 1500 km south-east of Hobart. It occurs in moist areas on the coastal rim less than 30 m above sea level.

The species is also subject to current and potential threats from rabbits, climate change and seal wallows. Consequently, the geographic distribution of the Windswept Helmet-orchid is precarious for the survival of the species.

The Committee considers that the species has a very restricted geographic distribution, which is precarious for the survival of the species due to the impacts of rabbits, climate change and sea wallows. 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

The estimated total number of mature individuals of the Windswept Helmet-orchid is not known. The current estimate of the total population size of the species is approximately 7500 individuals. However, no data have been collected on how many of these individuals are juvenile or adult plants. Consequently, the total number of mature individuals is at least limited. From 1997 to 2007 there was a 50% reduction in the area of occupancy of the species at one location at Bauer Bay. This decline was primarily caused by the development of a seal wallow, as well as to a lesser extent, disturbance by rabbits. It is estimated that up to 500 orchids were killed during this period. However, there is no evidence of continued decline. The species has been observed to recolonise the edges of this seal wallow and is showing some tolerance to this disturbance. Current information suggests that the species' numbers may increase in the future if the implementation of the Macquarie Island Pest Eradication Plan is successful in eradicating rabbits from Macquarie Island.

The Committee judges that the total number of mature individuals is limited; however there are no data available to suggest whether the number will continue to decline at a very high, high, substantial, or not substantial rate, or is likely to decline and the species' distribution is precarious for its survival. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 3, it is **not eligible** for listing in any category under this criterion.

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

The estimated total number of mature individuals of the Windswept Helmet-orchid is not known. The current estimate of the total population size of the species is approximately 7500 individuals. However, no data have been collected on how many of these individuals are juvenile or adult plants, although the total number of mature individuals is unlikely to be low.

There are insufficient data available to estimate whether or not the total number of mature individuals is extremely low, very low, or low. Therefore, as the species has not been demonstrated to have met this required element of Criterion 4, it is **not eligible** for listing in any category under this criterion.

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 been demonstrated to have not met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Conservation Status

Nematoceras dienemum (Windswept Helmet-orchid) is a small terrestrial orchid that is only found on Macquarie Island. It was nominated for inclusion in the list of threatened species referred to in section 178 of the EPBC Act. The nominator suggested listing in the endangered category of the list.

The Windswept Helmet-orchid has a very restricted geographic distribution which is precarious for its survival due to its isolated location and being subject to a range of current and potential threats such as rabbits, climate change and seal wallows. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 2 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. A recovery plan is not considered to be necessary at this time as the approved conservation advice provides sufficient direction to implement priority actions and mitigate against key threats.

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:

Nematoceras dienemum

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

Associate Professor Robert J.S. Beeton *AM FEIANZ*

Chair

Threatened Species Scientific Committee

13. References cited in the advice

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