

**Advice to the Minister for Environment Protection, 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. Reason for Conservation Assessment by the Committee

This advice follows assessment of new information provided through the Species Information Partnership with Tasmania on:

***Azorella macquariensis* (Macquarie Cushions)**

2. Summary of Species Details

Taxonomy	Conventionally accepted as <i>Azorella macquariensis</i> (Orchard, 1989).
State Listing Status	Pending listing as endangered under the Tasmanian <i>Threatened Species Protection Act 1995</i> .
Description	A perennial herb that forms extensive cushions and tight mats, and can vary in size from a few centimetres to several metres in diameter. There are two distinct forms of the species – hairy and non-hairy. The significance of these two forms is unknown. It flowers from December to February and fruits from January to April (DPIPWE, 2009).
Distribution	Endemic to Macquarie Island, a sub Antarctic island approximately 1500 km south-south-east of Tasmania (PWS, 2006; DPIPWE, 2009).
Relevant Biology/Ecology	<p>Macquarie Cushions occurs largely along the 200–400 m altitude plateau in feldmark vegetation, which covers approximately half of Macquarie Island in the most wind-exposed areas of the plateau region and upland areas (PWS, 2006; DPIPWE, 2009).</p> <p>Feldmark vegetation on Macquarie Island is comprised of dwarf flowering plants, mosses, lichens, liverworts and a significant amount of bare ground. Macquarie Cushions is the dominant vascular plant and forms a major structural component of feldmark vegetation (AAD, 2009; DPIPWE, 2009). Macquarie Cushions is also occasional on isolated rock stacks at lower elevations.</p> <p>Cushions of the species are composed of numerous individuals derived from seedlings, and some plants are capable of limited vegetative reproduction (DPIPWE, 2009; Threatened Species Section, 2009).</p>
Threats	
<i>Past</i>	N/A
<i>Present</i>	<p>Dieback</p> <p>A significant dieback epidemic affecting Macquarie Cushions was discovered in December 2008. The cause of the dieback is</p>

	<p>unknown and is currently being investigated by plant pathologists (DPIPWE, 2009; Threatened Species Section, 2009).</p> <p>Macquarie Cushions is showing dieback symptoms over the entire extent of its range, with greatest dieback in the northern part of Macquarie Island. The loss of Macquarie Cushions through this dieback epidemic will cause severe modification to the ecosystem and is likely to lead to major erosion problems and a decline of associated species on Macquarie Island (DPIPWE, 2009; Threatened Species Section, 2009).</p> <p>Monitoring of dieback over the winter following its discovery was not possible, as Macquarie Cushions undergoes natural winter browning, but will continue in summer 2009/2010 (DPIPWE, 2009; Threatened Species Section, 2009).</p> <p>Scraping by rabbits or rodents</p> <p>There is evidence that rabbits are causing some physical damage to Macquarie Cushions. However, while rabbits occasionally scratch and scrape the cushions with their teeth and claws, they have not been observed to have major detrimental effects on the species. Rabbit, rat and mice eradication are currently the subject of a vertebrate pests eradication program on Macquarie Island (PWS, 2007). It is possible that rabbits or rodents act as a vector for dieback (DPIPWE, 2009).</p>
<p><i>Future</i></p>	<p>Introduction of alien species:</p> <p>New introductions of alien species (plants, vertebrate, invertebrate or pathogen) could severely affect Macquarie Cushions directly, through competition, or through degradation of habitat (DPIPWE, 2009; Threatened Species Section, 2009).</p> <p>Climate change</p> <p>Climate data show a significant warming of Macquarie Island by over 0.5°C over the last 50 years (Tweedie and Bergstrom, 2000; Pendlebury and Barnes-Keoghan, 2007). Climate change may increase the risk of alien species, including pathogens, establishing on the island or increase impacts from existing species or pathogens, either directly or through changed interactions with other species (DPIPWE, 2009; Threatened Species Section, 2009).</p>

3. Public Consultation

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

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

Criterion 1: Eligible for listing as critically endangered

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

Criterion element	Evidence
Reduction in numbers	<p>Very severe – in March 2009, dieback was evident across the entire range of the species with approximately 90% of cushions dying in the worst affected sites, which are in the northern part of the island (Threatened Species Section, 2009). Only plants on isolated rock stacks and in patches of some swampy valley bottoms were reported to be unaffected by dieback before the onset of winter senescence in 2009 (DPIPWE, 2009).</p> <p>Current rates of dieback indicate a decline in the population throughout the species' entire range (DPIPWE, 2009). The species is likely to undergo a reduction in numbers of at least 80% within the next ten years (DPIPWE, 2009; Threatened Species Section, 2009).</p>

Criterion 2: Eligible for listing as critically endangered

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

Criterion element	Evidence
Geographic distribution AND	Very restricted – extent of occurrence is less than 90 km ² (DPIPWE, 2009; Threatened Species Section, 2009).
Geographic distribution precarious	Yes – exists at a single location and continued decline is inferred due to ongoing threats (DPIPWE, 2009; Threatened Species Section, 2009).

Criterion 3: Not eligible

The estimated total number of mature individuals is very low, low or limited; **and either** (a) evidence suggests that the number will continue to decline at a very high, high or substantial rate; **or** (b) the number is likely to continue to decline **and** its geographic distribution is precarious for its survival

Criterion element	Evidence
Total no. of mature individuals AND	Insufficient data – it is likely that there were many thousands of individual plants, prior to the dieback event, but the exact number is difficult to estimate, as the species forms cushions that vary enormously in both size and number of individuals (DPIPWE, 2009; Threatened Species Section, 2009).
Continued rate of decline	Very high – see Criterion 1.
OR	
Total no. of mature individuals AND	Insufficient data – see above.
Continued decline likely	Yes – see Criterion 1.

AND	
Geographic distribution precarious	Yes – see Criterion 2.

Criterion 4: Not eligible

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

Criterion element	Evidence
Total no. of mature individuals	Insufficient data – an assessment of cushions remaining in good health is planned for the 2009–2010 summer, after the plants emerge from winter senescence (DPIPWE, 2009; Threatened Species Section, 2009).

Criterion 5: Not eligible

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

Criterion element	Evidence
Probability of extinction in the wild	No data.

5. Recovery Plan

The Committee recommends that there should be a recovery plan for this species as the cause of dieback is unknown, and there is limited understanding about the actions required to abate the threat of dieback. Therefore a dynamic and coordinated approach is required to address this threat and a recovery plan best services this need.

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:

Azorella macquariensis

- (ii) The Committee recommends that there should be a recovery plan for this species.

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

Chair

Threatened Species Scientific Committee

6. References cited in the advice

- AAD (Australian Antarctic Division) (2009). Macquarie Island Flora. Plateau Uplands. Australian Antarctic Division, Tasmania
Viewed: 31 August 2009.
Available on the Internet at: <http://www.aad.gov.au/default.asp?casid=1977>
- DPIPWE (Department of Primary Industries, Parks, Water and Environment) (2009). Records held in DPIPWE's threatened flora files. Department of Primary Industries, Parks, Water and Environment, Tasmania.
- Orchard AE (1989). *Azorella* Lamarek (Hydrocotylaceae) on Heard and Macquarie Islands. *Muelleria* 7: 15–20.
- Pendlebury SF and Barnes-Keoghan (2007). Climate and climate change in the sub-Antarctic. *Papers and Proceedings of the Royal Society of Tasmania* 141: 67–81.
- PWS (Parks & Wildlife Service) (2006). Macquarie Island Nature Reserve and World Heritage Area Management Plan. Department of Primary Industries, Parks, Water and Environment, Hobart.
- PWS (Parks & Wildlife Service) (2007). Plan for the Eradication of Rabbits and Rodents on Subantarctic Macquarie Island. Department of Primary Industries, Parks, Water and Environment, Hobart.
- Threatened Species Section (2009). Notesheet for *Azorella macquariensis* (Macquarie Cushions). Department of Primary Industries, Parks, Water and Environment, Hobart.
Viewed: 31 August 2009.
Available on the Internet at: <http://www.dpiw.tas.gov.au/threatenedspecieslists>
- Tweedie CE and Bergstrom DM (2000). A climate change scenario for surface air temperature at subantarctic Macquarie Island. (pp. 272–281). In: *Antarctic Ecosystems: Models for Wider Ecological Understanding*. (Eds. Davison W, Howard-Jones C and Broady P). New Zealand Natural Sciences, Christchurch.